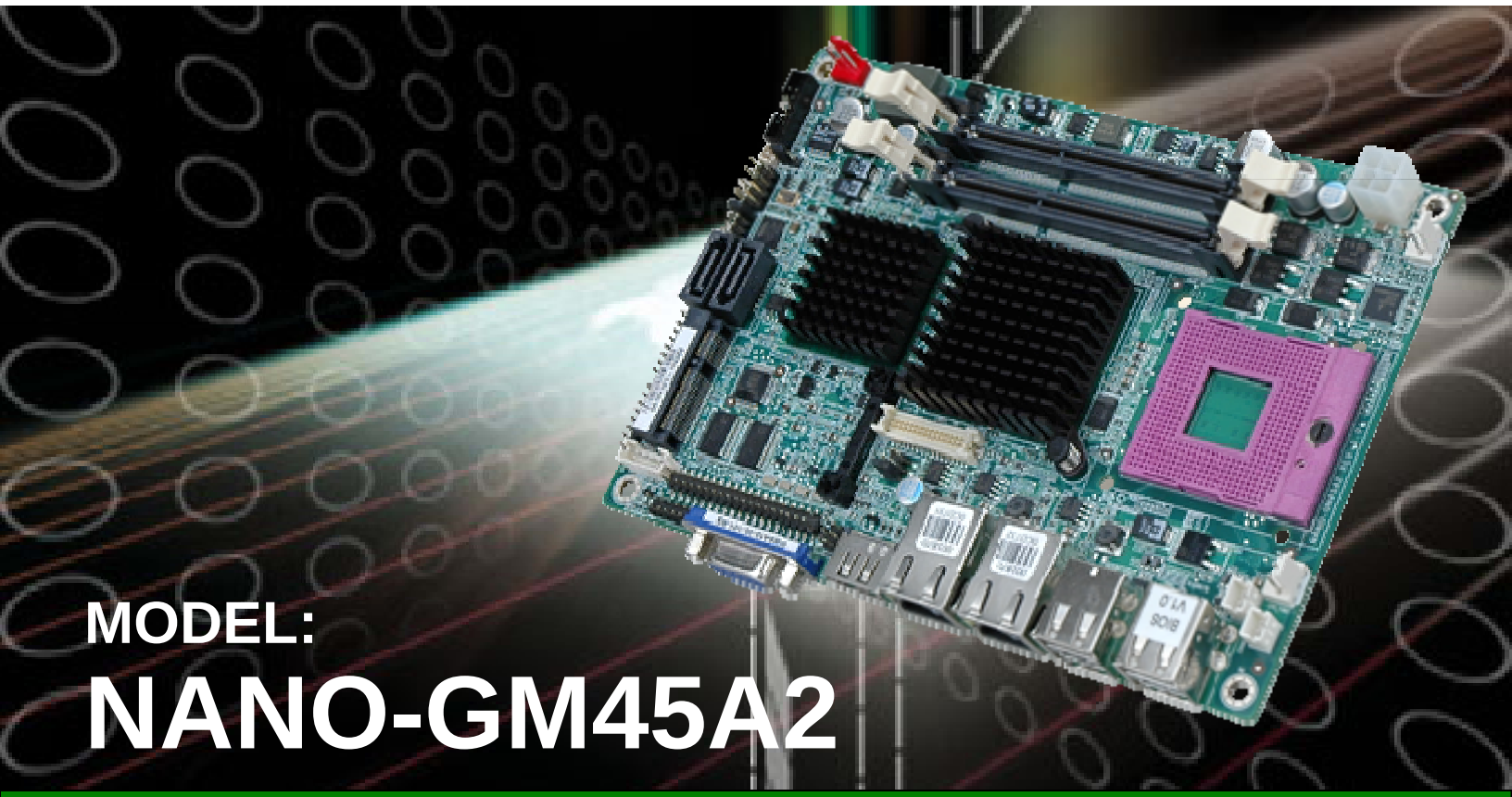
IEI Technology Corp.



MODEL:

NANO-GM45A2

EPIC Motherboard Supports Intel® Core™2 Duo CPU, VGA/LVDS/HDMI/HDTV-out, Dual GbE, USB 2.0 and Second Generation SATA 3Gb/s, RoHS Compliant

User Manual

Rev. 1.03 - 16 August, 2012

RoHS Lead Free

Revision

Date	Version	Changes
16 August, 2012	1.03	Modified **Figure 4-8: LVDS Voltage Selection Jumper Pinout Locations**
13 December, 2011	1.02	Updated **Section 3.2.8: LVDS LCD Connector** Updated maximum system memory specs. from 4.0 GB to 8.0 GB
21 October, 2010	1.01	Minor edit
5 May, 2010	1.00	Initial release

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Table of Contents

1 INTRODUCTION 1

1.1 INTRODUCTION 2
1.2 CONNECTORS 3
1.3 DIMENSIONS 4
1.4 DATA FLOW 5
1.5 TECHNICAL SPECIFICATIONS 6

2 UNPACKING 8

2.1 ANTI-STATIC PRECAUTIONS 9
2.2 UNPACKING PRECAUTIONS 9
2.3 PACKING LIST 10
2.3.1 Optional Items 11

3 CONNECTORS 12

3.1 PERIPHERAL INTERFACE CONNECTORS 13
3.1.1 NANO-GM45A2 Layout 13
3.1.2 Peripheral Interface Connectors 13
3.1.3 External Interface Panel Connectors 14
3.2 INTERNAL PERIPHERAL CONNECTORS 15
3.2.1 ATX Power Supply Enable Connector 15
3.2.2 Audio Connector 16
3.2.3 Backlight Inverter Connector 16
3.2.4 12V Power Connector 17
3.2.5 Fan Connectors 18
3.2.6 Front Panel Connector 19
3.2.7 IEEE 1394a Connectors 20
3.2.8 LVDS LCD Connector 21
3.2.9 PCIe Mini Card Slot 23
3.2.10 SATA Drive Connectors 24
3.2.11 SATA Power Connector (+5V) 25
3.2.12 Serial Port Connectors (COM 1 ~ COM 4) 26

3.2.13 SPI Flash Connector *28*
3.2.14 TV Out Connector *28*
3.3 EXTERNAL PERIPHERAL INTERFACE CONNECTOR PANEL 29
3.3.1 HDMI Connector *30*
3.3.2 LAN Connectors *30*
3.3.3 USB Connectors *31*
3.3.4 VGA Connector *32*

4 INSTALLATION 34

4.1 ANTI-STATIC PRECAUTIONS 35
4.2 INSTALLATION CONSIDERATIONS 36
4.2.1 Installation Notices *36*
4.2.2 Installation Checklist *37*
4.3 UNPACKING 38
4.4 CPU, CPU COOLING KIT AND SO-DIMM INSTALLATION 38
4.4.1 Socket P CPU Installation *38*
4.4.2 Socket P Cooling Kit Installation *40*
4.4.3 SO-DIMM Installation *41*
4.5 JUMPER SETTINGS 42
4.5.1 AT Power Select Jumper Settings *43*
4.5.2 Clear CMOS Jumper *44*
4.5.3 LVDS Panel Resolution Jumper *45*
4.5.4 LVDS Voltage Selection *47*
4.6 CHASSIS INSTALLATION 48
4.6.1 Airflow *48*
4.6.2 Motherboard Installation *48*
4.7 INTERNAL PERIPHERAL DEVICE CONNECTIONS 49
4.7.1 AT Power Connection *49*
4.7.2 ATX Power Connection *51*
4.7.3 Audio Kit Installation *55*
4.7.4 SATA Drive Connection *56*
4.8 EXTERNAL PERIPHERAL INTERFACE CONNECTION 57
4.8.1 LAN Connection (Single Connector) *57*
4.8.2 USB Connection (Dual Connector) *58*
4.8.3 VGA Monitor Connection *59*

4.9 SOFTWARE INSTALLATION 60

5 BIOS SCREENS 62

5.1 INTRODUCTION 63
5.1.1 Starting Setup 63
5.1.2 Using Setup 63
5.1.3 Getting Help 64
5.1.4 Unable to Reboot After Configuration Changes 64
5.1.5 BIOS Menu Bar 64
5.2 MAIN 65
5.3 ADVANCED 66
5.3.1 CPU Configuration 67
5.3.2 IDE Configuration 68
5.3.2.1 IDE Master, IDE Slave 69
5.3.3 AHCI Configuration 74
5.3.3.1 AHCI Port n 75
5.3.4 Remote Access Configuration 76
5.3.5 USB Configuration 79
5.3.6 Power Configuration 80
5.3.7 Super IO Configuration 82
5.4 PCI/PNP 84
5.5 BOOT 87
5.5.1 Boot Settings Configuration 87
5.6 SECURITY 89
5.7 CHIPSET 90
5.7.1 Northbridge Configuration 91
5.7.2 Southbridge Configuration 93
5.8 EXIT 94

A BIOS MENU OPTIONS 96

B ONE KEY RECOVERY 99

B.1 ONE KEY RECOVERY INTRODUCTION 100
B.1.1 System Requirement 101
B.1.2 Supported Operating System 102
B.2 SETUP PROCEDURE FOR WINDOWS 103

B.2.1 Hardware and BIOS Setup *103*
B.2.2 Create Partitions *104*
B.2.3 Install Operating System, Drivers and Applications *107*
B.2.4 Build-up Recovery Partition *108*
B.2.5 Create Factory Default Image *110*
B.3 SETUP PROCEDURE FOR LINUX 115
B.4 RECOVERY TOOL FUNCTIONS 118
B.4.1 Factory Restore *120*
B.4.2 Backup System *121*
B.4.3 Restore Your Last Backup *122*
B.4.4 Manual *123*
B.5 OTHER INFORMATION 124
B.5.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller *124*
B.5.2 System Memory Requirement *126*

C TERMINOLOGY 127

D WATCHDOG TIMER 132

E COMPATIBILITY 135

E.1 COMPATIBLE OPERATING SYSTEMS 136
E.2 COMPATIBLE PROCESSORS 137
E.3 COMPATIBLE MEMORY MODULES 137

F HAZARDOUS MATERIALS DISCLOSURE 139

F.1 HAZARDOUS MATERIAL DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS ROHS COMPLIANT UNDER 2002/95/EC WITHOUT MERCURY 140

List of Figures

Figure 1-1: NANO-GM45A2 2
Figure 1-2: Connectors 3
Figure 1-3: NANO-GM45A2 Dimensions (mm) 4
Figure 1-4: Data Flow Block Diagram 5
Figure 3-1: Connector and Jumper Locations 13
Figure 3-2: ATX Power Supply Enable Connector Location 15
Figure 3-3: Audio Connector Location 16
Figure 3-4: Panel Backlight Connector Pinout Locations 17
Figure 3-5: CPU 12V Power Connector Location 18
Figure 3-6: +12V Fan Connector Locations 19
Figure 3-7: Front Panel Connector Location 20
Figure 3-8: IEEE 1394a Connector Locations 21
Figure 3-9: LVDS LCD Connector Pinout Location 22
Figure 3-10: PCIe Mini Card Slot Location 23
Figure 3-11: SATA Drive Connector Locations 25
Figure 3-12: 5V Power Connector Locations 26
Figure 3-13: COM Connector Pinout Location 27
Figure 3-14: SPI Flash Connector 28
Figure 3-15: TV Connector Pinout Location 29
Figure 3-16: NANO-GM45A2 External Peripheral Interface Connector 30
Figure 3-17: RJ-45 Ethernet Connector 31
Figure 3-18: VGA Connector 33
Figure 4-1: Make sure the CPU socket retention screw is unlocked 39
Figure 4-2: Lock the CPU Socket Retention Screw 40
Figure 4-3: Cooling Kit Support Bracket 41
Figure 4-4: SO-DIMM Installation 42
Figure 4-5: AT Power Select Jumper Location 44
Figure 4-6: Clear CMOS Jumper 45
Figure 4-7: LVDS Panel Resolution Jumper Pinout Locations 46
Figure 4-8: LVDS Voltage Selection Jumper Pinout Locations 48
Figure 4-9: Power Cable to Motherboard Connection 50

Figure 4-10: Connect Power Cable to Power Supply 51
Figure 4-11: Power Cable to Motherboard Connection 52
Figure 4-12: Connect Power Cable to ATX Adapter Cable 53
Figure 4-13: Connect ATX Power Adapter Cable to Power Supply 54
Figure 4-14: Connect ATX Power Cable to Motherboard 54
Figure 4-15: Audio Kit Cable Connection 55
Figure 4-16: SATA Drive Cable Connection 56
Figure 4-17: SATA Power Drive Connection 57
Figure 4-18: LAN Connection 58
Figure 4-19: USB Connector 59
Figure 4-20: VGA Connector 60
Figure 4-21: Introduction Screen 61
Figure 4-22: Available Drivers 61
Figure A-1: IEI One Key Recovery Tool Menu 100
Figure A-2: Launching the Recovery Tool 104
Figure A-3: Recovery Tool Setup Menu 105
Figure A-4: Command Mode 105
Figure A-5: Partition Creation Commands 106
Figure A-6: Launching the Recovery Tool 108
Figure A-7: System Configuration for Windows 108
Figure A-8: Build-up Recovery Partition 109
Figure A-9: Press any key to continue 109
Figure A-10: Press F3 to Boot into Recovery Mode 110
Figure A-11: Recovery Tool Menu 110
Figure A-12: About Symantec Ghost Window 111
Figure A-13: Symantec Ghost Path 111
Figure A-14: Select a Local Source Drive 112
Figure A-15: Select a Source Partition from Basic Drive 112
Figure A-16: File Name to Copy Image to 113
Figure A-17: Compress Image 113
Figure A-18: Image Creation Confirmation 114
Figure A-19: Image Creation Process 114
Figure A-20: Image Creation Complete 114
Figure A-21: Press Any Key to Continue 115
Figure A-22: Partitions for Linux 116

Figure A-23: System Configuration for Linux 117
Figure A-24: Access menu.lst in Linux (Text Mode) 117
Figure A-25: Recovery Tool Menu 118
Figure A-26: Recovery Tool Main Menu 119
Figure A-27: Restore Factory Default 120
Figure A-28: Recovery Complete Window 120
Figure A-29: Backup System 121
Figure A-30: System Backup Complete Window 121
Figure A-31: Restore Backup 122
Figure A-32: Restore System Backup Complete Window 122
Figure A-33: Symantec Ghost Window 123

List of Tables

Table 1-1: Technical Specifications 7
Table 3-1: Peripheral Interface Connectors 14
Table 3-2: Rear Panel Connectors 14
Table 3-3: ATX Power Supply Enable Connector Pinouts 15
Table 3-4: Audio Connector Pinouts 16
Table 3-5: Panel Backlight Connector Pinouts 17
Table 3-6: CPU 12V Power Connector Pinouts 18
Table 3-7: +12V Fan Connector Pinouts 19
Table 3-8: Front Panel Connector Pinouts 20
Table 3-9: IEEE 1394a Connector Pinouts 21
Table 3-10: LVDS LCD Port Connector Pinouts 23
Table 3-11: PCIe Mini Card Slot Pinouts 24
Table 3-12: SATA Drive Connector Pinouts 25
Table 3-13: 5V Power Connector Pinouts 26
Table 3-14: COM Connector Pinouts 27
Table 3-15: SPI Flash Connector 28
Table 3-16: TV Port Connector Pinouts 29
Table 3-17: HDMI Connector Pinouts 30
Table 3-18: LAN Pinouts 31
Table 3-19: RJ-45 Ethernet Connector LEDs 31
Table 3-20: USB Port Connector Pinouts (USB1_2) 32
Table 3-21: USB Port Connector Pinouts (USB3_4) 32
Table 3-22: VGA Connector Pinouts 33
Table 4-1: Jumpers 43
Table 4-2: AT Power Select Jumper Settings 43
Table 4-3: Clear CMOS Jumper Settings 45
Table 4-4: LVDS Panel Resolution Jumper Settings 46
Table 4-5: LVDS Voltage Selection Jumper Settings 47
Table 5-1: BIOS Navigation Keys 64

List of BIOS Menus

BIOS Menu 1: Main 65
BIOS Menu 2: Advanced 67
BIOS Menu 3: CPU Configuration 67
BIOS Menu 4: IDE Configuration 68
BIOS Menu 5: IDE Master and IDE Slave Configuration 70
BIOS Menu 6: AHCI Configuration 75
BIOS Menu 7: AHCI Port n Configuration Menu 76
BIOS Menu 8: Remote Access Configuration 77
BIOS Menu 9: USB Configuration 79
BIOS Menu 10: APM Configuration 81
BIOS Menu 11: Super IO Configuration 82
BIOS Menu 12: PCI/PnP Configuration 85
BIOS Menu 13: Boot 87
BIOS Menu 14: Boot Settings Configuration 87
BIOS Menu 15: Security 89
BIOS Menu 16: Chipset 91
BIOS Menu 17:Northbridge Chipset Configuration 91
BIOS Menu 18:Southbridge Chipset Configuration 93
BIOS Menu 19:Exit 95

Chapter

1

Introduction

1.1 Introduction

Figure 1-1: NANO-GM45A2

The NANO-GM45A2 EPIC motherboard is a Socket P Intel® Core™2 Duo processor with 1066/800 MHz Front Side Bus (FSB) and Intel® Celeron® M processor with 667 MHz FSB platform.

Up to two 4.0 GB 1066 MHz or 800 MHz un-buffered DDR3 SDRAM SO-DIMM are supported by the Intel® GM45 graphics memory controller hub (GMCH). The Intel® GM45 GMCH also supports 18-bit or 24-bit dual-channel LVDS, analog CRT, HDMI and HDTV output.

The integrated Intel® ICH9M I/O controller hub (ICH) supports two SATA 3Gb/s drives with data transfer speeds of 3.0 Gbps. Four USB 2.0 channels and one expansion PCIe mini socket provide flexible expansion options. High Definition Audio (HDA) support ensures HDA devices can be easily implemented on the NANO-GM45A2.

1.2 Connectors

The connectors on the NANO-GM45A2 are shown in the figure below.

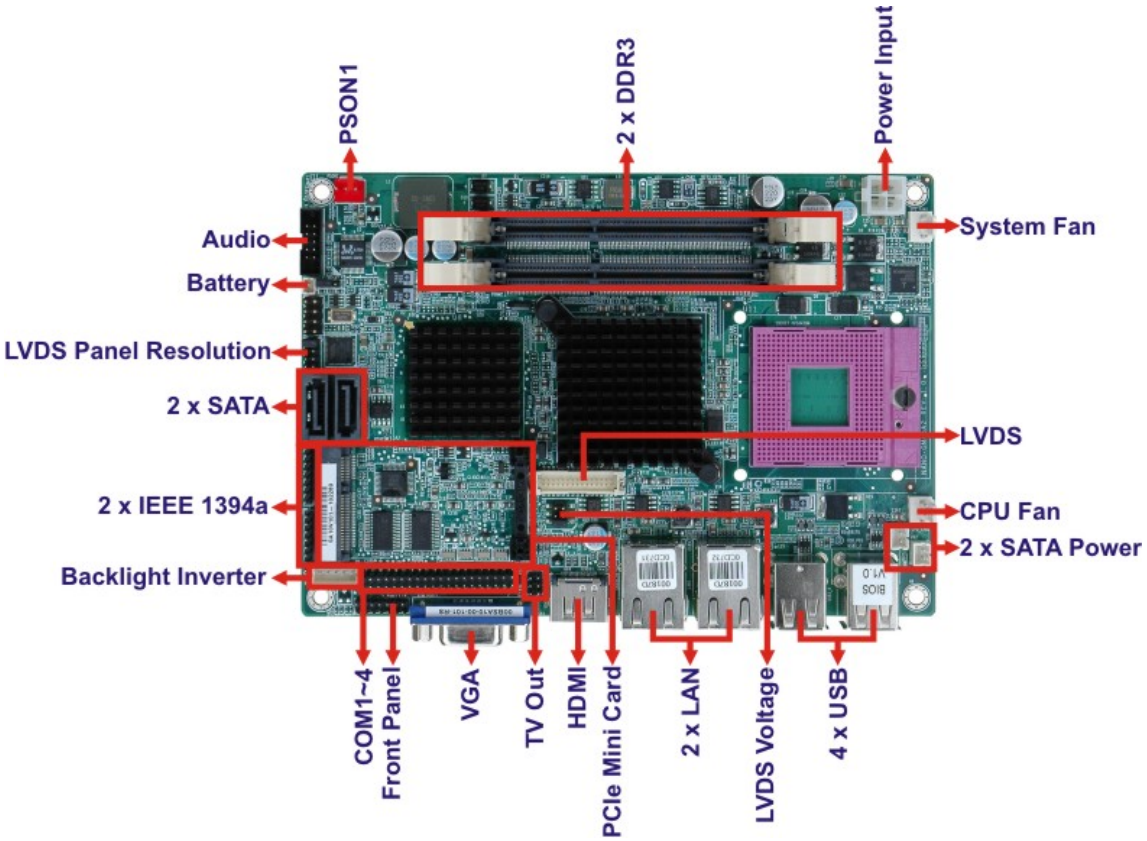


Figure 1-2: Connectors

1.3 Dimensions

The dimensions of the board are listed below:

- **Length**: 115 mm
- **Width**: 165 mm

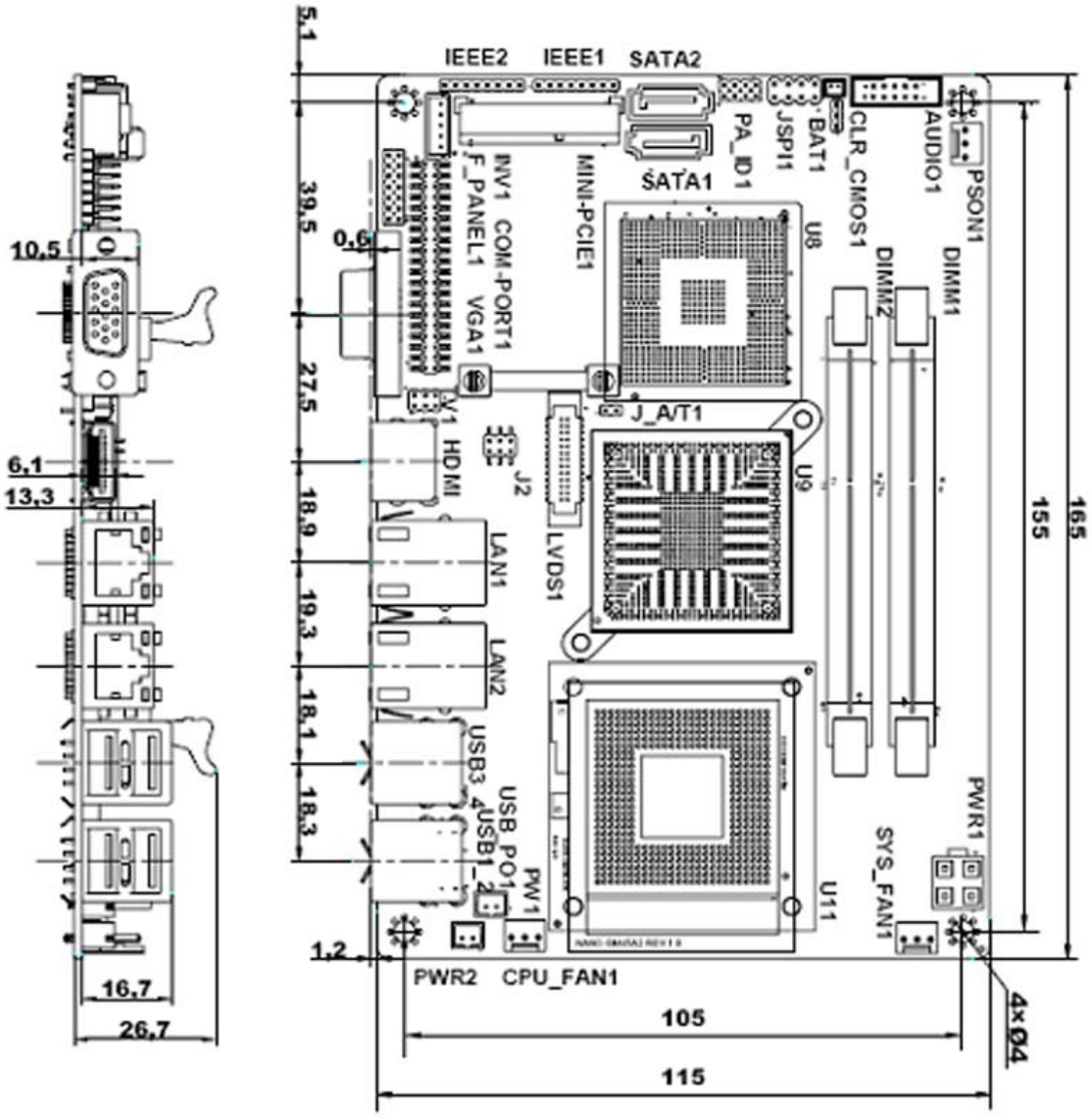


Figure 1-3: NANO-GM45A2 Dimensions (mm)

1.4 Data Flow

Figure 1-4 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

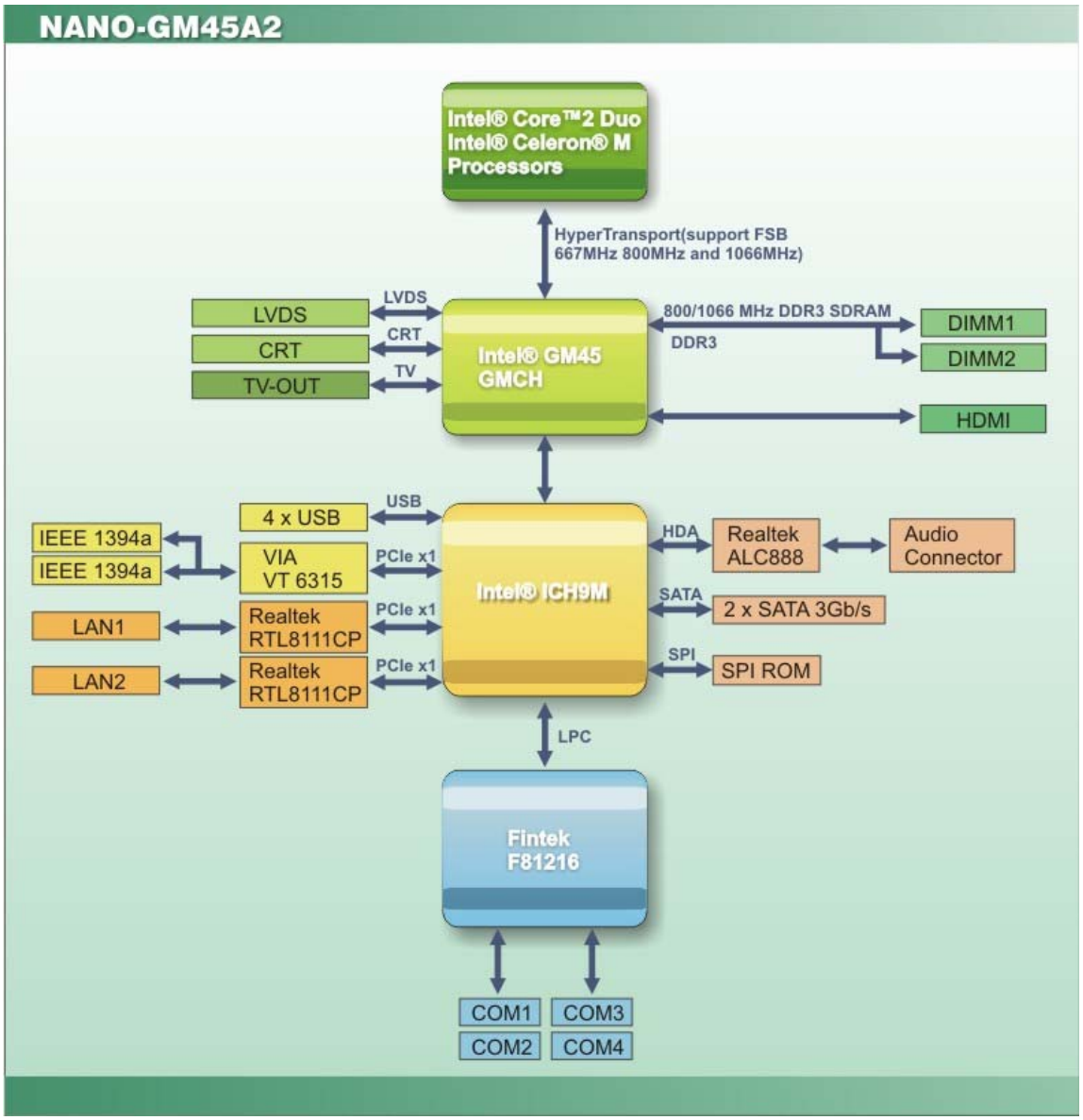


Figure 1-4: Data Flow Block Diagram

1.5 Technical Specifications

NANO-GM45A2 technical specifications are listed in table below.

Specification	NANO-GM45A2
Form Factor	EPIC
Socket	Socket P
CPU Supported	45 nm Socket P Intel® Core™2 Duo processor 45 nm Socket P Intel® Celeron® M processor
Front Side Bus (FSB)	1066 MHz (Max.), 800 MHz or 667 MHz
Northbridge Chipset	Intel® GM45
Southbridge Chipset	Intel® ICH9M
Memory	Two 204-pin 1066/800 MHz DDR3 SDRAM SO-DIMMs up to 4.0 GB each (system max. 8 GB)
Audio	Realtek ALC888 HD 7.1 channel audio codec
LAN	Two Realtek RTL8111CP PCIe GbE controllers
Super I/O	Fintek F81216AD
BIOS	AMI BIOS label
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	
PCIe	One PCIe mini slot
I/O Interface Connectors	
Audio Connector	One internal audio connector (10-pin box header)
Display port	One VGA port One 18-bit or 24-bit dual-channel LVDS connector One TV-out connector supports HDTV One external HDMI port supports up to 1080p

Specification	NANO-GM45A2
Ethernet	Two RJ-45 GbE ports
IEEE 1394a	Two via internal 8-pin header
Serial Ports	Four RS-232 via internal 40-pin header
USB 2.0/1.1 ports	Four external USB ports
Storage	
Serial ATA	Two independent serial ATA (SATA) channels with 3.0 Gb/s data transfer rates
Environmental and Power Specifications	
Power Supply	12 V only ATX and AT power supported
Power Consumption	12 V @ 3.06A Intel® Core™2 Duo T9400 CPU with 1 GB 1066 MHz DDR3 SO-DIMM
Operating temperature	-10ºC ~ 60ºC (requires cooler and silicone heat sink paste)
Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	165 mm x 115 mm
Weight GW/NW	700g/350g

Table 1-1: Technical Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the NANO-GM45A2 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the NANO-GM45A2 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The NANO-GM45A2 is shipped with the following components:

Quantity	Item and Part Number	Image
1	NANO-GM45A2 motherboard	
1	Audio cable (**P/N:** 32000-072100-RS)	
2	SATA cable (**P/N**: 32000-062800-RS)	
1	AT 12V Cable (**P/N**: 32100-087100-RS)	
1	Dual IEEE 1394a cable (w bracket) (**P/N**:CB-IEEE1394-RS)	
1	Quad RS-232 cable (**P/N**: 32200-147900-RS)	

1	Mini jumper pack (2.0mm) (**P/N**: 33100-000033-RS)	
1	Utility CD	
1	Quick Installation Guide	

2.3.1 Optional Items

The following components are options for the NANO-GM45A2:

Item and Part Number	Image
CPU cooler (**P/N**: CF-479B-RS)	
CPU cooler for Intel® Core™2 Duo Processor T9400 (**P/N**: CF-479F-RS)	
HDTV output cable (**P/N**: 32000-083702-RS)	
SATA power cable (**P/N**: 32102-000100-100-RS **P/N**: 32102-000100-200-RS)	
SATA cable and 5 V power output cable for NANO series (**P/N**: 32000-114001-RS)	
ATX power cable (**P/N**: 32100-043403-RS)	

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 NANO-GM45A2 Layout

The figures below show all the connectors and jumpers.

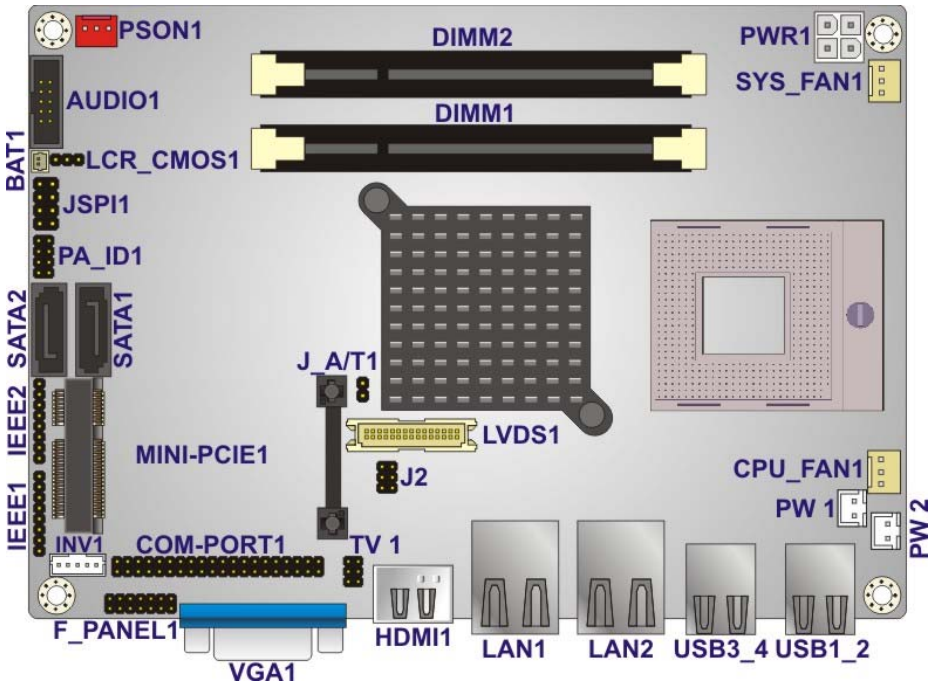


Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
ATX power control connector	3-pin wafer	PSON1
Audio connector	10-pin box header	AUDIO1
Backlight inverter connector	5-pin wafer	INV1
Battery connector	2-pin wafer	BAT1

Connector	Type	Label
DDR3 SO-DIMM sockets	204-pin socket	DIMM1, DIMM2
Fan connector (CPU)	3-pin wafer	CPU_FAN1
Fan connector (system)	3-pin wafer	SYS_FAN1
Front panel connector	14-pin header	F_PANEL1
IEEE 1394a connectors	8-pin header	IEEE1, IEEE2
LVDS connector	30-pin crimp	LVDS1
PCIe mini socket	PCIe mini socket	MINI_PCIE1
Power connector (+12V)	4-pin connector	PWR1
RS-232 serial port connector (COM1~COM4)	40-pin header	COM-PORT1
SATA power connectors	2-pin wafer	PW1, PW2
Serial ATA (SATA) drive connectors	7-pin SATA	SATA1, SATA2
SPI Flash connector	8-pin header	JSPI1
TV Out connector	6-pin header	TV1

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1, LAN2
HDMI port	HDMI Type A port	HDMI1
USB ports (dual)	USB port	USB1_2, USB3_4
VGA port connector	15-pin female	VGA1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the NANO-GM45A2.

3.2.1 ATX Power Supply Enable Connector

CN Label:	**PSON1**
CN Type:	3-pin wafer (1x3)
CN Location:	See **Figure 3-2**
CN Pinouts:	See **Table 3-3**

The ATX power supply enable connector enables the NANO-GM45A2 to be connected to an ATX power supply. In default mode, the NANO-GM45A2 can only use an AT power supply. To enable an ATX power supply the AT Power Select jumper must also be configured. Please refer to **Chapter 4** for more details.

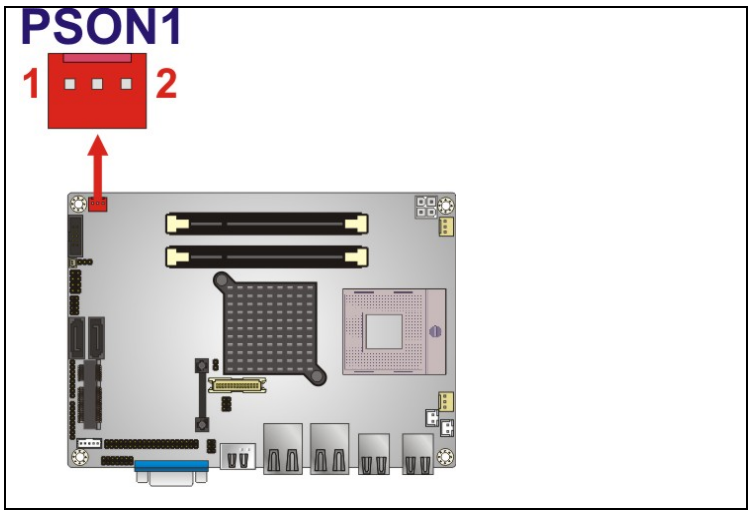


Figure 3-2: ATX Power Supply Enable Connector Location

PIN NO.	DESCRIPTION
1	+V5SB
2	IO_PSON#
3	GND

Table 3-3: ATX Power Supply Enable Connector Pinouts

3.2.2 Audio Connector

CN Label: **AUDIO1**

CN Type: 10-pin box header (2x5)

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-4**

The audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

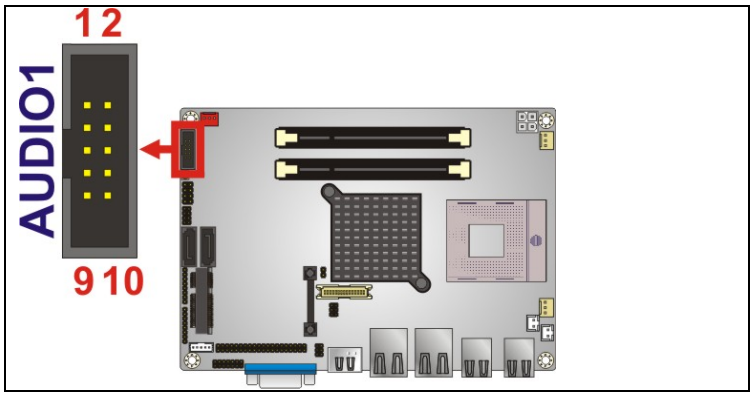


Figure 3-3: Audio Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINEOUTR	2	LINE1R
3	GND	4	GND
5	LINEOUTL	6	LINE1L
7	GND	8	GND
9	FMIC1R	10	FMIC1L

Table 3-4: Audio Connector Pinouts

3.2.3 Backlight Inverter Connector

CN Label: **INV1**

CN Type: 5-pin wafer (1x5)

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-5**

The backlight inverter connector provides the backlight on the LCD display connected to the NANO-GM45A2 with +12V of power.

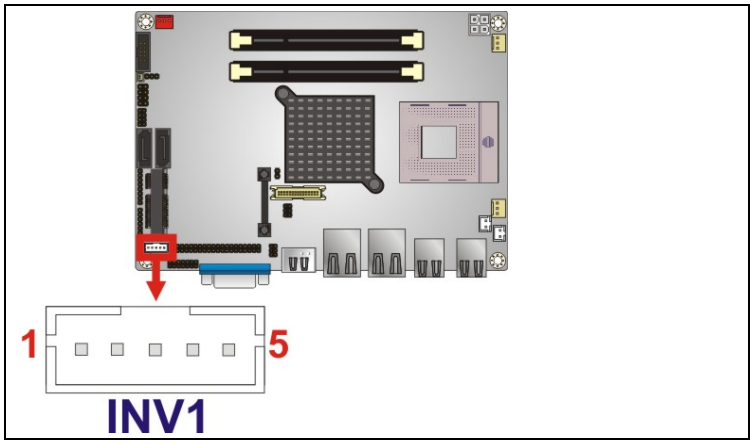


Figure 3-4: Panel Backlight Connector Pinout Locations

PIN NO.	DESCRIPTION
1	LCD Backlight Control
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT Enable

Table 3-5: Panel Backlight Connector Pinouts

3.2.4 12V Power Connector

CN Label: **PWR1**

CN Type: 4-pin ATX connector (1x4)

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-6**

The connector supports the 12V power supply.

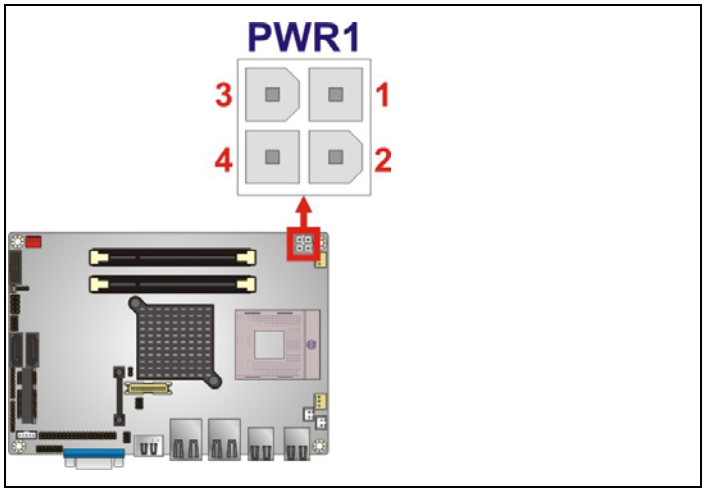


Figure 3-5: CPU 12V Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

Table 3-6: CPU 12V Power Connector Pinouts

3.2.5 Fan Connectors

CN Label: **CPU_FAN1** and **SYS_FAN1**

CN Type: 3-pin wafer (1x3)

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-7**

The cooling fan connector provides a 12V, 500mA current to the cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the

system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

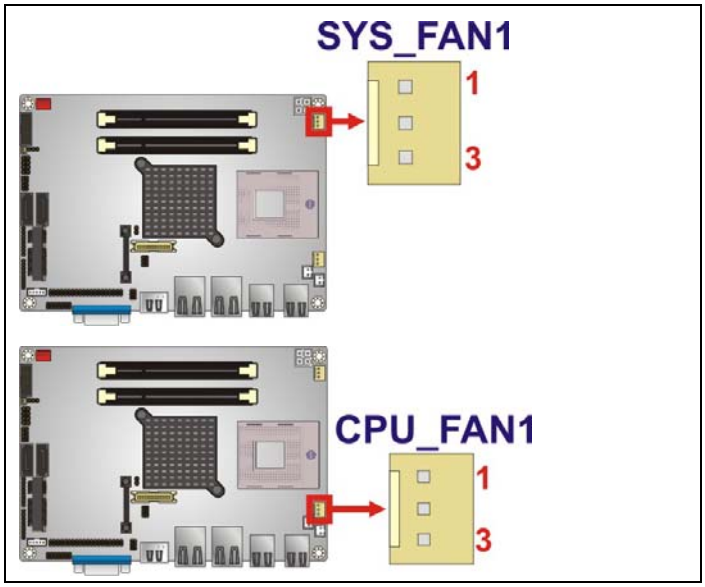


Figure 3-6: +12V Fan Connector Locations

PIN NO.	DESCRIPTION
1	N/C
2	+12V
3	GND

Table 3-7: +12V Fan Connector Pinouts

3.2.6 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-8**

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button

- Reset
- Power LED
- HDD LED

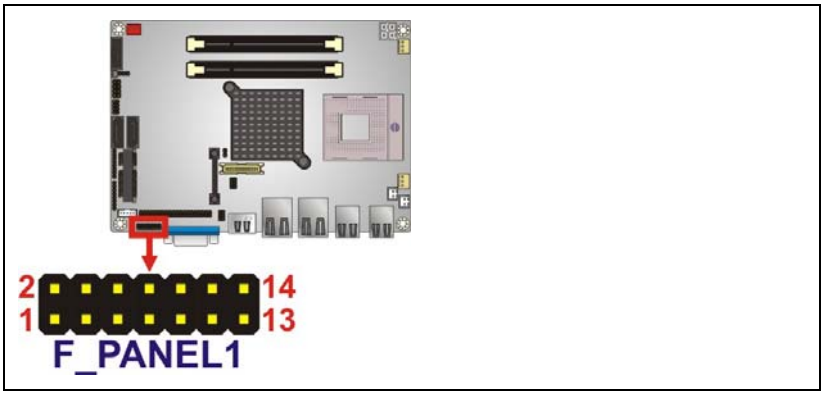


Figure 3-7: Front Panel Connector Location

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	+V5S	System Beeper	2	+V5S
	3	N/C		4	N/C
	5	GND		6	N/C
Power Button	7	PWR_BT#		8	PC_BEEP
	9	GND		10	N/C
HDD LED	11	+V5S	Reset	12	PM_SYSRST#
	13	SB_SATA_LED		14	GND

Table 3-8: Front Panel Connector Pinouts

3.2.7 IEEE 1394a Connectors

CN Label: **IEEE1** and **IEEE2**

CN Type: 8-pin header (1x8)

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-9**

The 8-pin connector is connected to IEEE 1394a interface for high-speed data transfer.

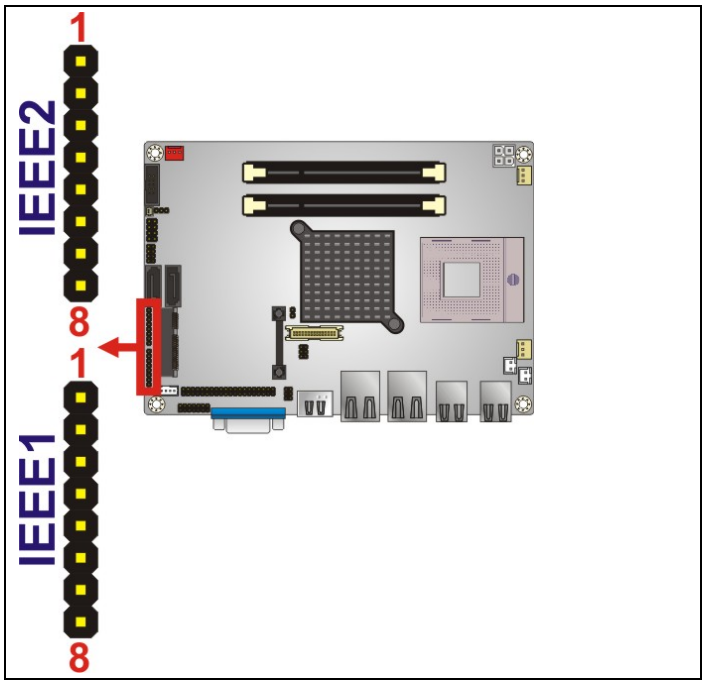


Figure 3-8: IEEE 1394a Connector Locations

PIN NO.	DESCRIPTION
1	+V12S
2	GND
3	XTPBM
4	XTPBP
5	XTPAM
6	XTPAP
7	GND
8	GND

Table 3-9: IEEE 1394a Connector Pinouts

3.2.8 LVDS LCD Connector

CN Label: **LVDS1**

CN Type: 30-pin crimp (3x10)

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-10**

The 30-pin LVDS LCD connectors can be connected to single channel or dual channel, 18-bit LVDS panel.

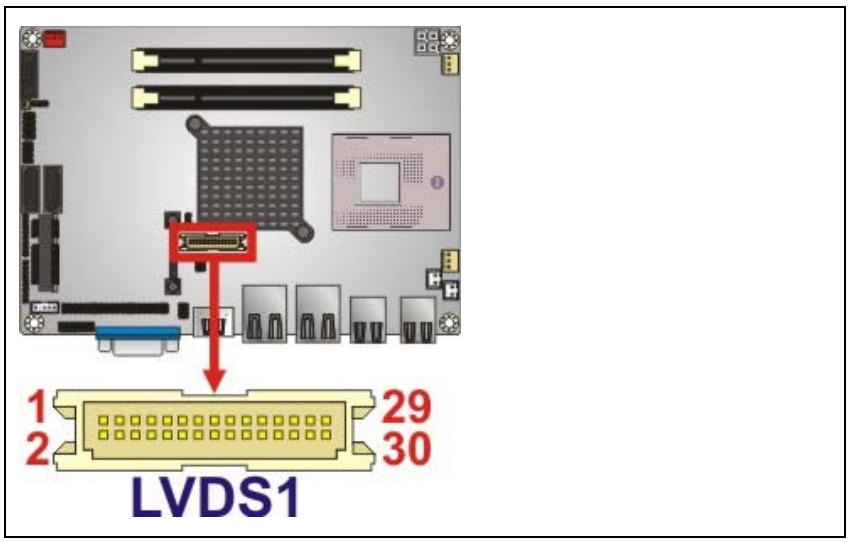


Figure 3-9: LVDS LCD Connector Pinout Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	LVDS_TXL0P	4	LVDS_TXL0N
5	LVDS_TXL1P	6	LVDS_TXL1N
7	LVDS_TXL2P	8	LVDS_TXL2N
9	LVDS_TXLCKP	10	LVDS_TXLCKN
11	LVDS_TXL3P	12	LVDS_TXL3N
13	GND	14	GND
15	LVDS_TXU0P	16	LVDS_TXU0N
17	LVDS_TXU1P	18	LVDS_TXU1N
19	LVDS_TXU2P	20	LVDS_TXU2N
21	LVDS_TXUCKP	22	LVDS_TXUCKN
23	LVDS_TXU3P	24	LVDS_TXU3N
25	GND	26	GND
27	+LCD	28	+LCD

29	+LCD	30	+LCD

Table 3-10: LVDS LCD Port Connector Pinouts

3.2.9 PCIe Mini Card Slot

CN Label: **MINI_PCIE1**

CN Type: 52-pin PCIe Mini Card Slot

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

The PCIe mini card slot enables a PCIe mini card expansion module to be connected to the board. Cards supported include among others wireless LAN (WLAN) cards and IEI miniDOM SSD cards.

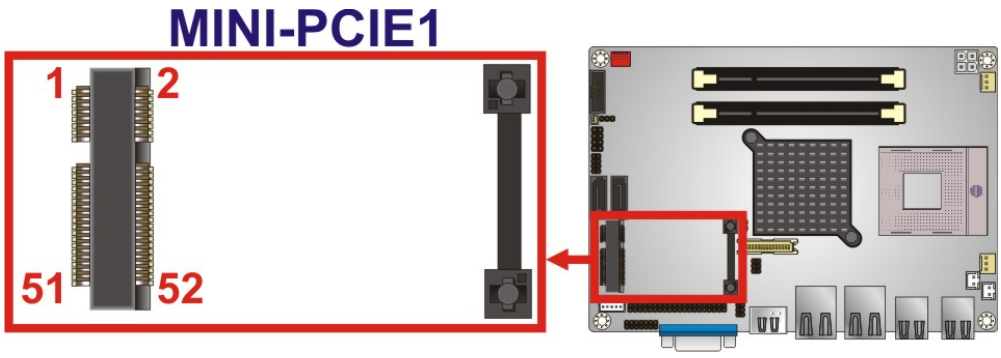


Figure 3-10: PCIe Mini Card Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	3.3V
3	N/C	4	GND
5	N/C	6	1.5V
7	CLKREQ#	8	UIM__PWR

9	GND	10	UIM_DATA
11	CLK-	12	UIM_CLK
13	CLK+	14	UIM_RESET
15	GND	16	UIM_VPP
17	UIM_C8	18	GND
19	UIM_C4	20	W_DISABLE#
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	SRX5+	40	GND
41	SRX5-	42	LED_WWAN#
43	STX5-	44	LED_WLAN#
45	STX5+	46	LED_WPAN#
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	3.3V

Table 3-11: PCIe Mini Card Slot Pinouts

3.2.10 SATA Drive Connectors

CN Label: **SATA1** and **SATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-12**

The SATA connectors connect to SATA hard drives or optical drives.

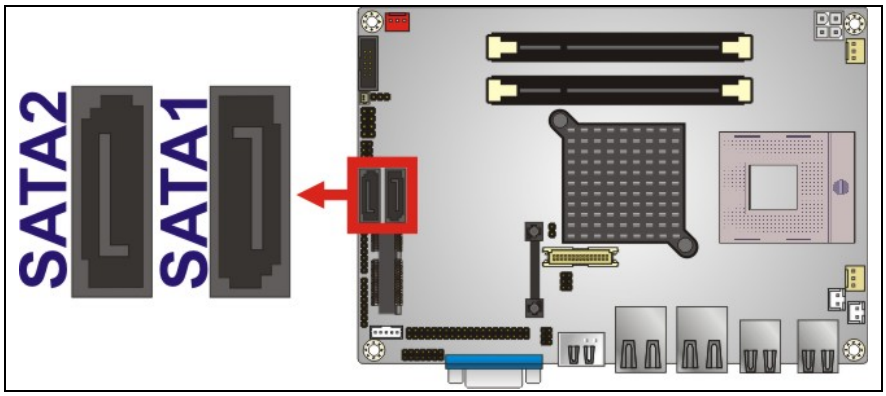


Figure 3-11: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-12: SATA Drive Connector Pinouts

3.2.11 SATA Power Connector (+5V)

CN Label: **PW1 and PW2**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-13**

The 5V Power Connector provides +5V power output to the SATA connector.

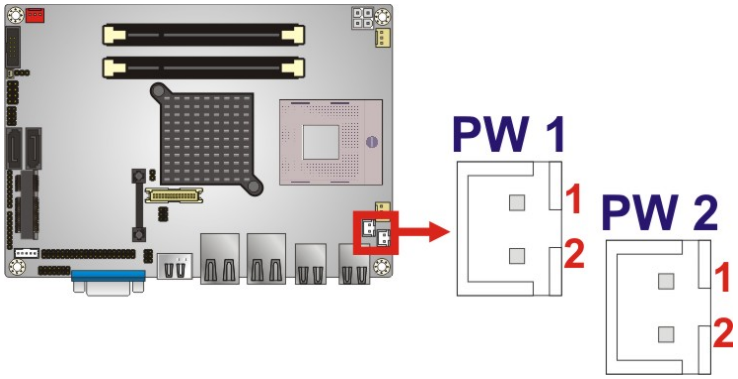


Figure 3-12: 5V Power Connector Locations

PIN NO.	DESCRIPTION
1	+5V
2	GND

Table 3-13: 5V Power Connector Pinouts

3.2.12 Serial Port Connectors (COM 1 ~ COM 4)

CN Label: **COM-PORT1**

CN Type: 40-pin header (2x20)

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-14**

The 40-pin serial port connector contains the following four serial ports: COM1, COM2, COM3 and COM4. All these serial ports are RS-232 serial communications channels. The serial port locations are specified below.

- COM1 is located on pin 1 to pin 10
- COM2 is located on pin 11 to pin 20
- COM3 is located on pin 21 to pin 30
- COM4 is located on pin 31 to pin 40

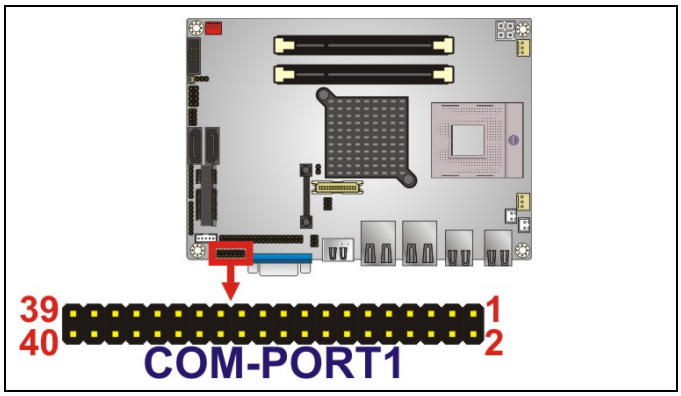


Figure 3-13: COM Connector Pinout Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD1	2	NDSR1
3	NRX1	4	NRTS1
5	NTX1	6	NCTS1
7	NDTR1	8	NRI1
9	GND	10	GND
11	NDCD2	12	NDSR2
13	NRX2	14	NRTS2
15	NTX2	16	NCTS2
17	NDTR2	18	NRI2
19	GND	20	GND
21	NDCD3	22	NDSR3
23	NRX3	24	NRTS3
25	NTX3	26	NCTS3
27	NDTR3	28	NRI3
29	GND	30	GND
31	NDCD4	32	NDSR4
33	NRX4	34	NRTS4
35	NTX4	36	NCTS4
37	NDTR4	38	NRI4
39	GND	40	GND

Table 3-14: COM Connector Pinouts

3.2.13 SPI Flash Connector

CN Label: **JSPI1**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-15**

The 8-pin SPI Flash connector is used to flash the BIOS.

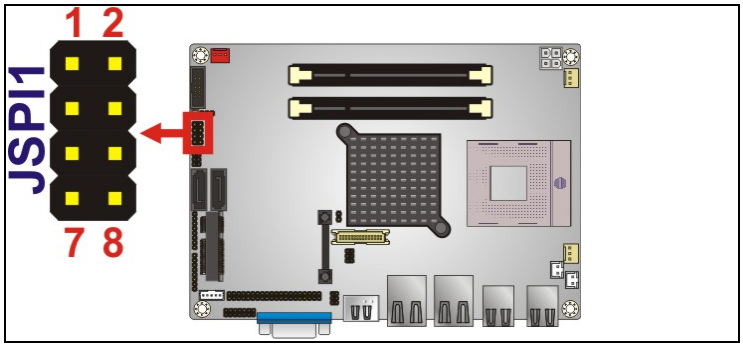


Figure 3-14: SPI Flash Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPI_VCC (+3.3 V)	2	GND
3	U46_CS#0	4	U46_CLK
5	U46_SO0	6	U46_SI
7	N/C	8	N/C

Table 3-15: SPI Flash Connector

3.2.14 TV Out Connector

CN Label: **TV1**

CN Type: 6-pin header (2x3)

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-16**

The 2x3 pin TV out connector connects to a TV output by using an S-Video or RCA connector. The TV out connector makes displaying media data on a television easier.

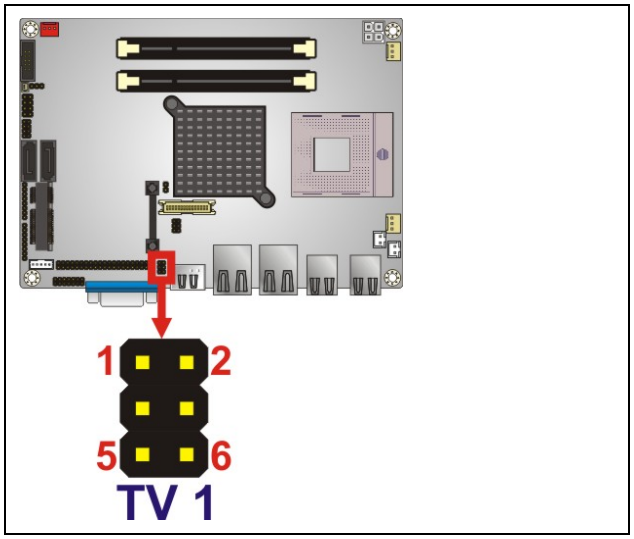


Figure 3-15: TV Connector Pinout Location

S-Video Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	2	ABLUE_CVBS
3	GND	4	AGREEN_Y
5	GND	6	ARED_C

Table 3-16: TV Port Connector Pinouts

3.3 External Peripheral Interface Connector Panel

Figure 3-16 shows the NANO-GM45A2 external peripheral interface connector (EPIC) panel. The NANO-GM45A2 EPIC panel consists of the following:

- 1 x HDMI connector
- 2 x RJ-45 LAN connectors
- 4 x USB connectors
- 1 x VGA connector

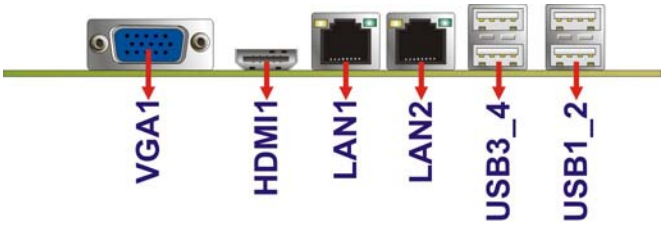


Figure 3-16: NANO-GM45A2 External Peripheral Interface Connector

3.3.1 HDMI Connector

CN Label: **HDMI1**

CN Type: HDMI type A connector

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-17**

The HDMI (High-Definition Multimedia Interface) connector connects to digital audio or video sources.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	HDMI_DATA2	2	GND
3	HDMI_DATA2#	4	HDMI_DATA1
5	GND	6	HDMI_DATA1#
7	HDMI_DATA0	8	GND
9	HDMI_DATA0#	10	HDMI_CLK
11	GND	12	HDMI_CLK#
13	N/C	14	N/C
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+V5S
19	HDMI_HPD		

Table 3-17: HDMI Connector Pinouts

3.3.2 LAN Connectors

CN Label: **LAN1** and **LAN2**

CN Type: RJ-45

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-18**

The NANO-GM45A2 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3	MDIA2-	7	MDIA0-
4	MDIA1-	8	MDIA0+

Table 3-18: LAN Pinouts

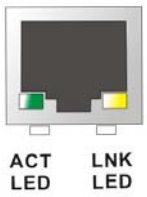


Figure 3-17: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-19**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 3-19: RJ-45 Ethernet Connector LEDs

3.3.3 USB Connectors

CN Label: **USB1_2** and **USB3_4**

CN Type: USB port

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-20**

The NANO-GM45A2 has four external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	5	+5V
2	USBP0N	6	USBP1N
3	USBP0P	7	USBP1P
4	GND	8	GND

Table 3-20: USB Port Connector Pinouts (USB1_2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	5	+5V
2	USBP2N	6	USBP3N
3	USBP2P	7	USBP4P
4	GND	8	GND

Table 3-21: USB Port Connector Pinouts (USB3_4)

3.3.4 VGA Connector

CN Label: **VGA1**

CN Type: 15-pin Female

CN Location: See **Figure 3-16**

CN Pinouts: See **Figure 3-18** and **Table 3-22**

The NANO-GM45A2 has a single 15-pin female connector for connectivity to standard display devices.

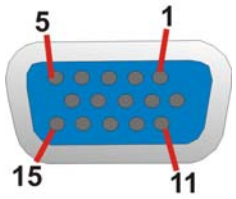


Figure 3-18: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	9	VGAVCC
2	GREEN	10	GROUND
3	BLUE	11	NC
4	NC	12	DDCDAT
5	GROUND	13	HSYNC
6	GROUND	14	VSYNC
7	GROUND	15	DDCCLK
8	GROUND		

Table 3-22: VGA Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the NANO-GM45A2 may result in permanent damage to the NANO-GM45A2 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the NANO-GM45A2. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the NANO-GM45A2 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the NANO-GM45A2, place it on an antic-static pad. This reduces the possibility of ESD damaging the NANO-GM45A2.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the NANO-GM45A2 is installed. All installation notices pertaining to the installation of the NANO-GM45A2 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the NANO-GM45A2 and injury to the person installing the motherboard.

4.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the NANO-GM45A2, NANO-GM45A2 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the NANO-GM45A2 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the NANO-GM45A2 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the NANO-GM45A2 off:

- When working with the NANO-GM45A2, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the NANO-GM45A2 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.2 Installation Checklist

The following checklist is provided to ensure the NANO-GM45A2 is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The NANO-GM45A2 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - Primary and secondary IDE device
  - SATA drives
  - Power supply
  - USB cable
  - Serial port cable
- The following external peripheral devices are properly connected to the chassis:
  - VGA screen
  - Keyboard
  - Mouse
  - RS-232 serial communications device
  - USB devices

4.3 Unpacking

When the NANO-GM45A2 is unpacked, please check all the unpacking list items listed in Chapter 3 are indeed present. If any of the unpacking list items are not available please contact the NANO-GM45A2 vendor reseller/vendor where the NANO-GM45A2 was purchased or contact an IEI sales representative.

4.4 CPU, CPU Cooling Kit and SO-DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, NANO-GM45A2 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the NANO-GM45A2. If one of these component is not installed the NANO-GM45A2 cannot run.

4.4.1 Socket P CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket P CPU onto the NANO-GM45A2, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Unlock the CPU retention screw.** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 4-1**.

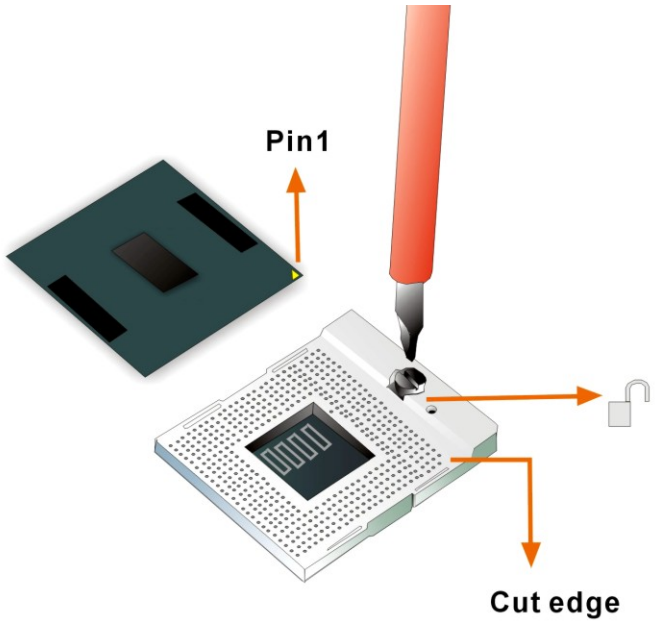


Figure 4-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Correctly Orientate the CPU**. Make sure the IHS (integrated heat sink) side is facing upwards.

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 4-1**.

Step 5: **Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.

Step 6: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

Step 7: **Lock the retention screw.** Rotate the retention screw into the locked position. See **Figure 4-2**.

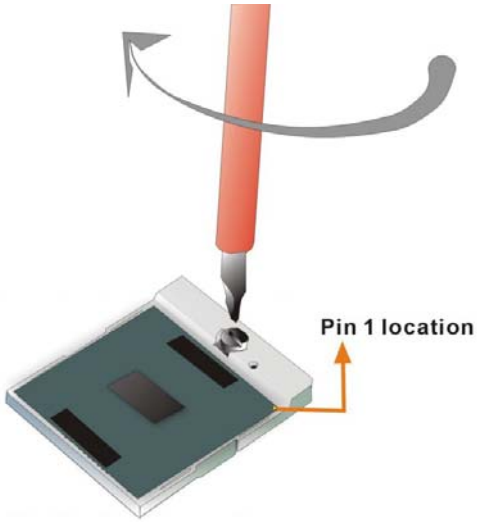


Figure 4-2: Lock the CPU Socket Retention Screw

4.4.2 Socket P Cooling Kit Installation

An IEI Socket P CPU cooling kit can be purchased separately. (See **Chapter 3**) The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, please follow the steps below.

Step 1: **Install the cooling kit bracket**. A cooling kit bracket is installed on the rear of the motherboard. Align the bracket with the four retention holes at the back of the motherboard. Once properly aligned, insert four retention screws from the front of the motherboard.

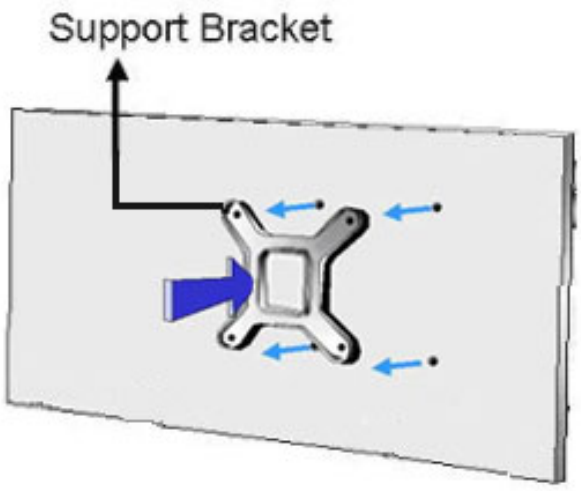


Figure 4-3: Cooling Kit Support Bracket

Step 2: **Open the lever at the top of the heat sink**. Lift the lever at the top of the cooling kit to loosen the cooling kit clamps.

Step 3: **Secure the cooling kit**. Gently place the heat sink and cooling kit onto the CPU. Make sure the hooks are properly secured to the bracket. To secure the cooling kit, close the top lever.

Step 4: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the NANO-GM45A2. Carefully route the cable and avoid heat generating chips and fan blades.

4.4.3 SO-DIMM Installation

To install an SO-DIMM, please follow the steps below and refer to **Figure 4-4**.

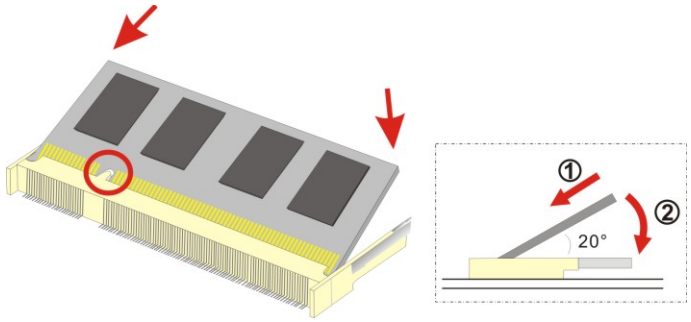


Figure 4-4: SO-DIMM Installation

Step 1: **Locate the SO-DIMM socket**. Place the board on an anti-static mat.

Step 2: **Align the SO-DIMM with the socket**. Align the notch on the memory with the notch on the memory socket.

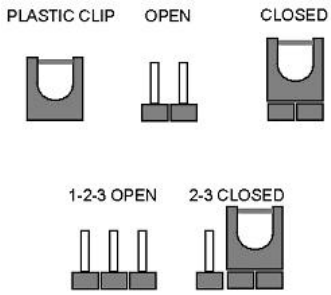
Step 3: **Insert the SO-DIMM**. Push the memory in at a 20º angle. (See **Figure 4-4**)

Step 4: **Seat the SO-DIMM**. Gently push downwards and the arms clip into place. (See **Figure 4-4**)

4.5 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Before the NANO-GM45A2 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the NANO-GM45A2 are listed in **Table 4-1**.

Description	Label	Type
AT Power Mode Setting	J_A/T1	2-pin wafer
Clear CMOS	CLR_CMOS1	3-pin header
LVDS Panel Resolution	PA_ID1	8-pin header
LVDS Voltage Select	J2	6-pin header

Table 4-1: Jumpers

4.5.1 AT Power Select Jumper Settings

NOTE:

The AT Power Select Jumper is the same as the ATX Enable connector.

Jumper Label: **J_A/T1**

Jumper Type: 2-pin header

Jumper Settings: See **Table 4-2**

Jumper Location: See **Figure 4-5**

The AT Power Select jumper specifies the systems power mode as AT or ATX. AT Power Select jumper settings are shown in **Table 4-2**.

AT Power Select	Description	
Short 1 – 2	Use AT power	Default
Open	Use ATX power	

Table 4-2: AT Power Select Jumper Settings

The location of the AT Power Select jumper is shown in **Figure 4-5** below.

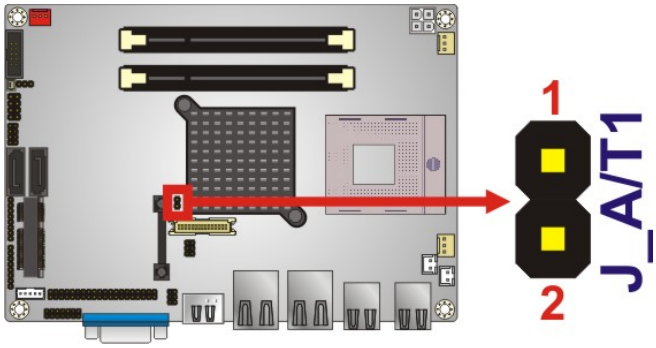


Figure 4-5: AT Power Select Jumper Location

4.5.2 Clear CMOS Jumper

Jumper Label:	**CLR_CMOS1**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-3**
Jumper Location:	See **Figure 4-6**

If the NANO-GM45A2 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 4-3**.

Clear CMOS	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 4-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-6** below.

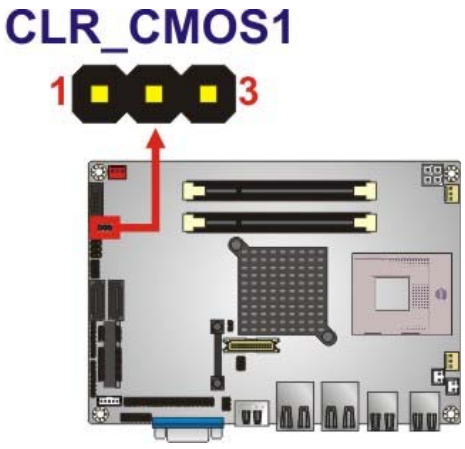


Figure 4-6: Clear CMOS Jumper

4.5.3 LVDS Panel Resolution Jumper

Jumper Label: **PA_ID1**

Jumper Type: 8-pin header

Jumper Settings: See **Table 4-4**

Jumper Location: See **Figure 4-7**

The LVDS Panel Resolution jumper allows the resolution of the LVDS screens connected to the LVDS1 connector to be configured. The LVDS Panel Resolution jumper settings are shown in **Table 4-4**.

PA_ID1	Description	
Open	640 x 480 (18-bit)	
Short 1-2	800 x 480 (18-bit)	
Short 3-4	1024 x 768 (18-bit)	Default
Short 1-2, 3-4	1024 x 768 (24-bit)	
Short 5-6	1024 x 768 (48-bit)	
Short 1-2, 5-6	1280 x 1024 (48-bit)	
Short 3-4, 5-6	1600 x 1200 (48-bit)	
Short 1-2, 3-4, 5-6	1280 x 768 (18-bit)	
Short 7-8	1280 x 800 (18-bit)	
Short 1-2, 7-8	1366 x 768 (24-bit)	
Short 3-4, 7-8	1440 x 900 (36-bit)	
Short 1-2, 3-4, 7-8	1440 x 900 (48-bit)	
Short 5-6, 7-8	1680 x 1050 (48-bit)	
Short 1-2, 5-6, 7-8	1920 x 1080 (48-bit)	
Short 3-4, 5-6, 7-8	1920 x 1200 (48-bit)	

Table 4-4: LVDS Panel Resolution Jumper Settings

The LVDS Panel Resolution jumper location is shown in **Figure 4-7**.

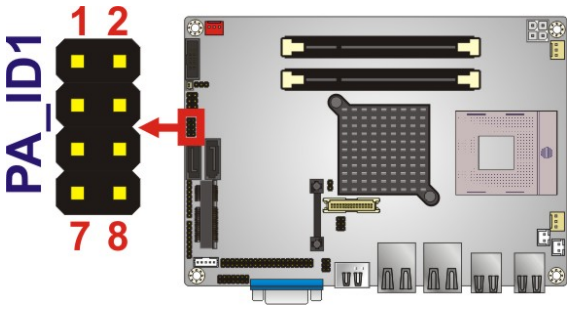


Figure 4-7: LVDS Panel Resolution Jumper Pinout Locations

4.5.4 LVDS Voltage Selection

WARNING:

Permanent damage to the screen and NANO-GM45A2 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that cam with the monitor to select the correct voltage.

Jumper Label:	**J2**
Jumper Type:	6-pin header
Jumper Settings:	See **Table 4-5**
Jumper Location:	See **Figure 4-8**

The **LVDS Voltage Selection** jumpers allow the LVDS screen voltages to be set. The jumper sets the voltage connected to LVDS1. The **LVDS Voltage Selection** jumper settings are shown in **Table 4-5**.

LCD Voltage Select	Description	
Short 1-2	+3.3V	Default
Short 3-4	+5V	
Short 5-6	+12V	

Table 4-5: LVDS Voltage Selection Jumper Settings

The LVDS Voltage Selection jumper location is shown in **Figure 4-8**.

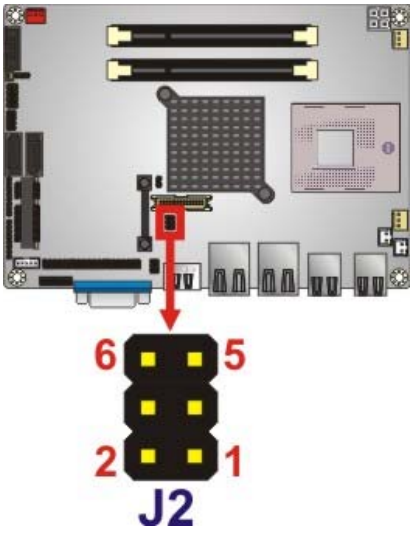


Figure 4-8: LVDS Voltage Selection Jumper Pinout Locations

4.6 Chassis Installation

4.6.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the NANO-GM45A2 must have air vents to allow cool air to move into the system and hot air to move out.

The NANO-GM45A2 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.6.2 Motherboard Installation

To install the NANO-GM45A2 motherboard into the chassis please refer to the reference material that came with the chassis.

4.7 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors

4.7.1 AT Power Connection

Follow the instructions below to connect the NANO-GM45A2 to an AT power supply.

WARNING:

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the NANO-GM45A2.

Step 1: **Locate the power cable**. The power cable is shown in the packing list in **Chapter 3**.

Step 2: **Connect the Power Cable to the Motherboard**. Connect the 4-pin (2x2) Molex type power cable connector to the AT power connector on the motherboard. See Figure 4-9.

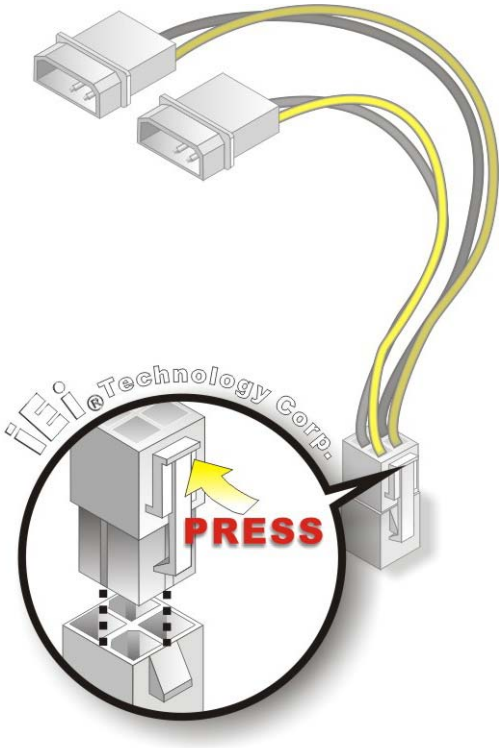


Figure 4-9: Power Cable to Motherboard Connection

Step 3: **Connect Power Cable to Power Supply**. Connect one of the 4-pin (1x4) Molex type power cable connectors to an AT power supply. See Figure 4-10.

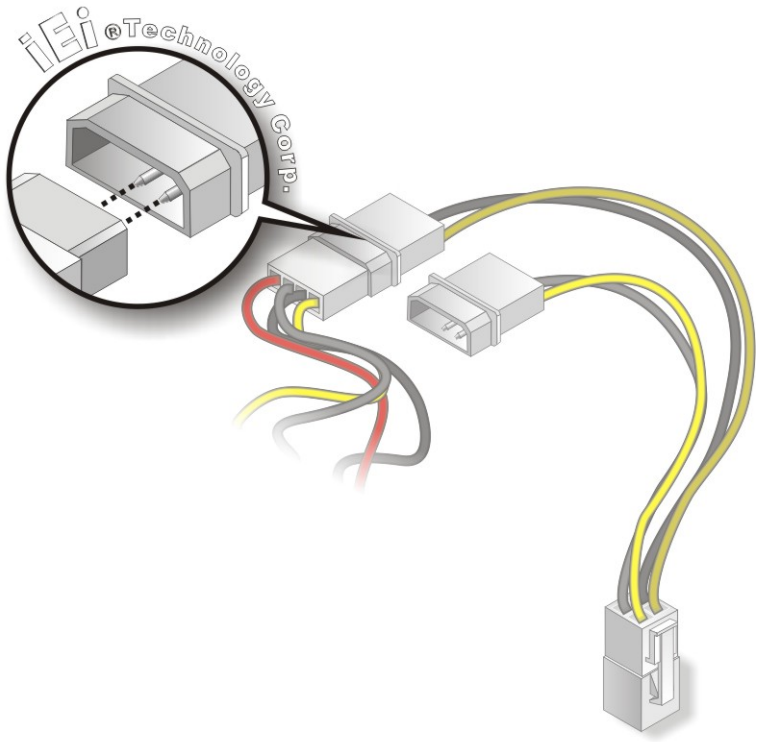


Figure 4-10: Connect Power Cable to Power Supply

4.7.2 ATX Power Connection

Follow the instructions below to connect the NANO-GM45A2 to an ATX power supply.

WARNING:

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the NANO-GM45A2.

Step 1: **Locate the power cable**. The power cable is shown in the packing list in **Chapter 3**.

Step 2: **Connect the Power Cable to the Motherboard**. Connect the 4-pin (2x2) Molex type power cable connector to the AT power connector on the motherboard. See **Figure 4-11**.

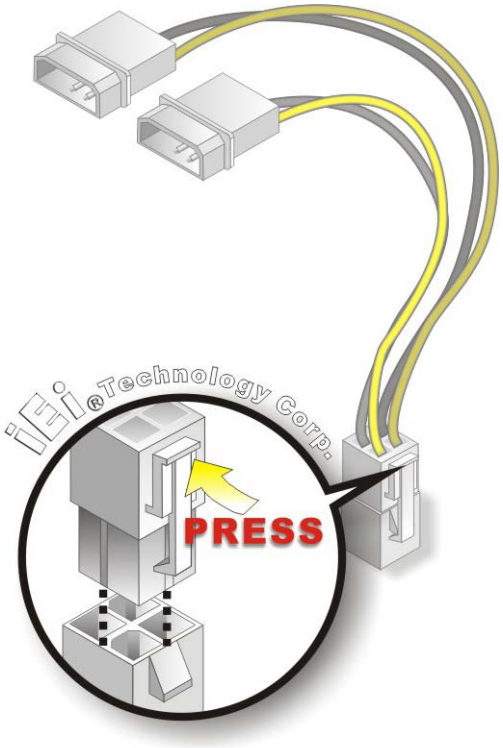


Figure 4-11: Power Cable to Motherboard Connection

Step 3: **Connect the Power Cable to an ATX Power Adapter Cable**. Connect one of the 4-pin (1x4) Molex type power cable connectors to a 20-pin ATX power adapter cable. See Figure 4-12.

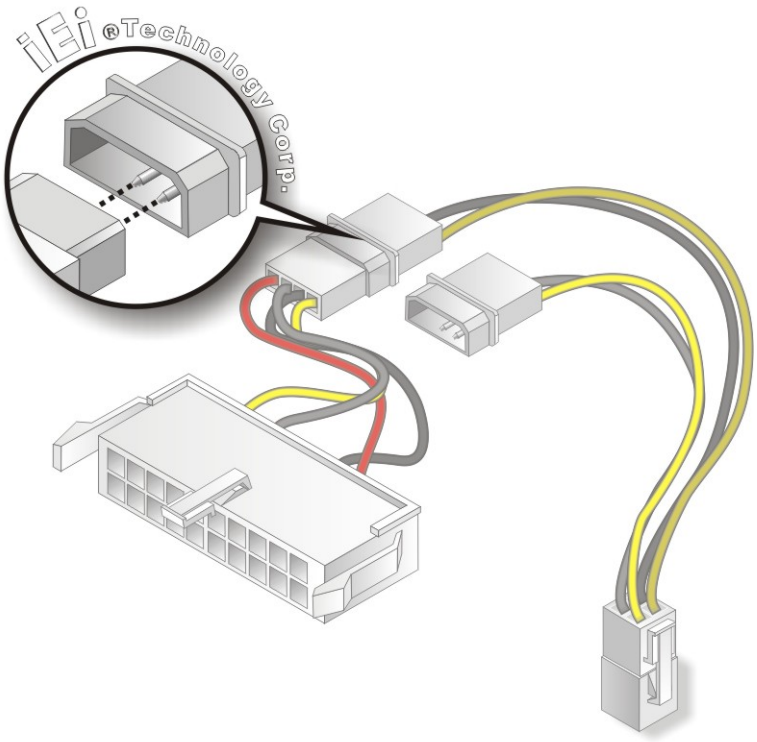


Figure 4-12: Connect Power Cable to ATX Adapter Cable

Step 4: **Connect ATX Power Adapter Cable to Power Supply**. Connect the 20-pin ATX power adapter cable to an ATX power supply. See Figure 4-13.

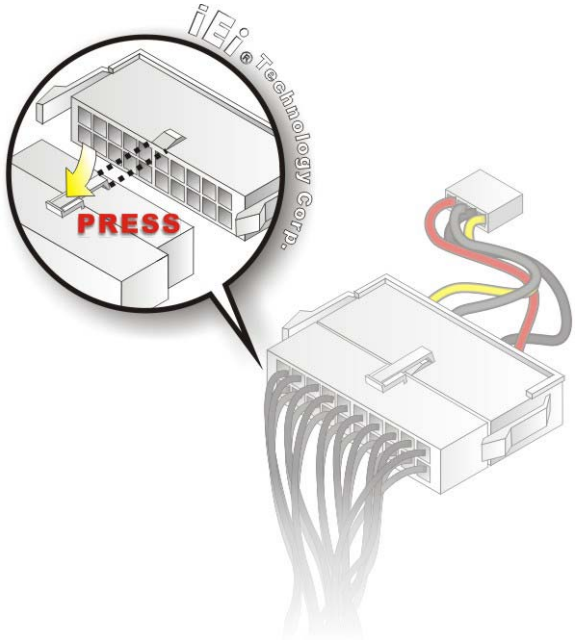


Figure 4-13: Connect ATX Power Adapter Cable to Power Supply

Step 5: **Connect ATX Power Cable to Motherboard**. Connect the 3-pin ATX power connector to the ATX power connector on the motherboard. See Figure 4-14.

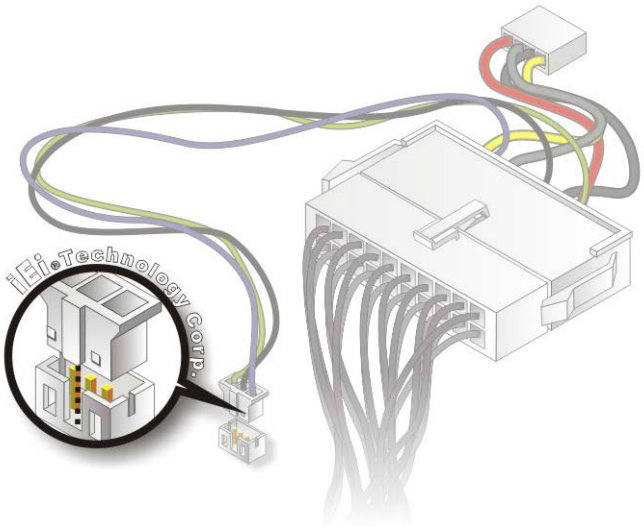


Figure 4-14: Connect ATX Power Cable to Motherboard

4.7.3 Audio Kit Installation

The Audio Kit that came with the NANO-GM45A2 connects to the audio connector on the NANO-GM45A2. The audio kit consists of three audio jacks. Mic-in connects to a microphone. Line-in provides a stereo line-level input to connect to the output of an audio device. Line-out, a stereo line-level output, connects to two amplified speakers. To install the audio kit, please refer to the steps below:

Step 1: **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 2: **Align pin 1**. Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 4-15**.

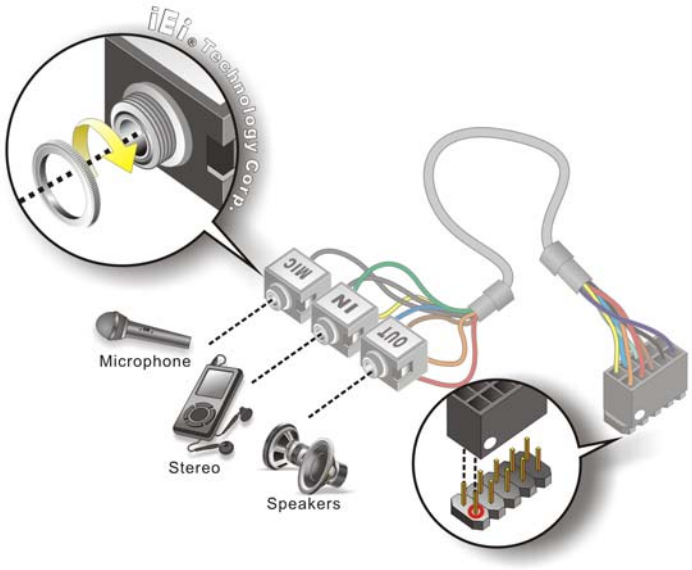


Figure 4-15: Audio Kit Cable Connection

Step 3: **Connect the audio devices**. Connect speakers to the line-out audio jack. Connect the output of an audio device to the line-in audio jack. Connect a microphone to the mic-in audio jack.

4.7.4 SATA Drive Connection

The NANO-GM45A2 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the cable connector into the on-board SATA drive connector until it clips into place. See **Figure 4-16**.

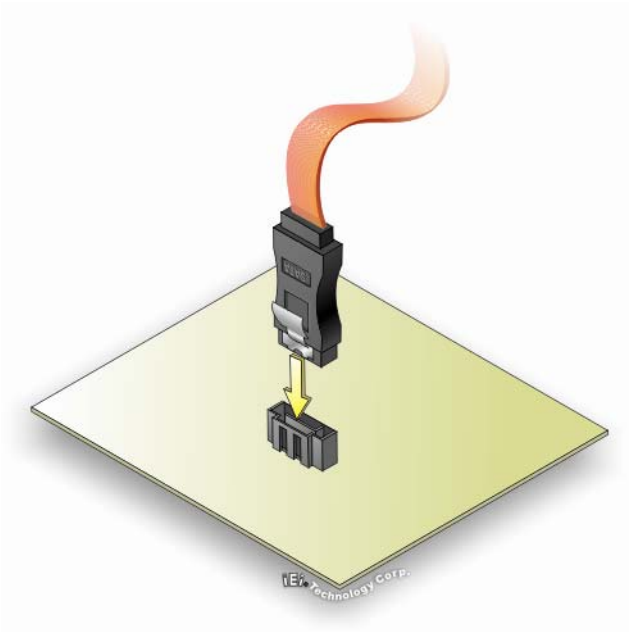


Figure 4-16: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-17**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-17**.

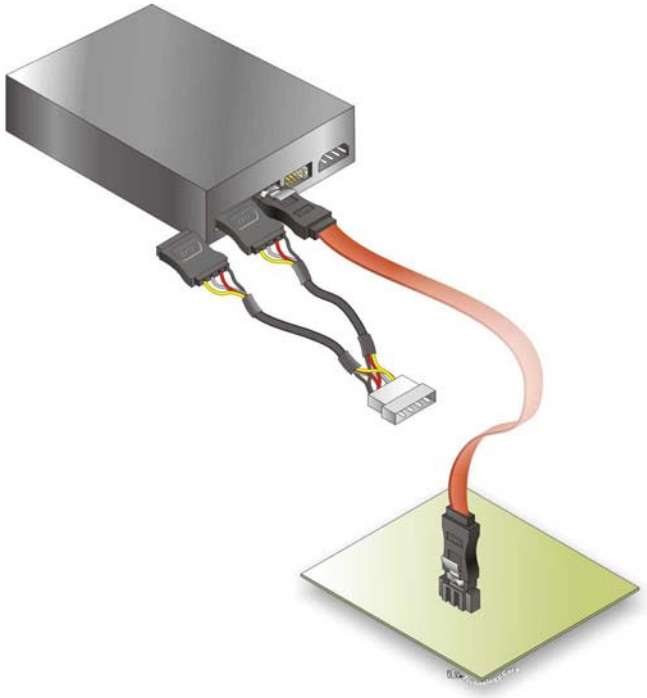


Figure 4-17: SATA Power Drive Connection

4.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- RJ-45 Ethernet cable connectors
- USB devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding NANO-GM45A2 external peripheral interface connector making sure the pins are properly aligned.

4.8.1 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the NANO-GM45A2. See **Figure 4-18**.

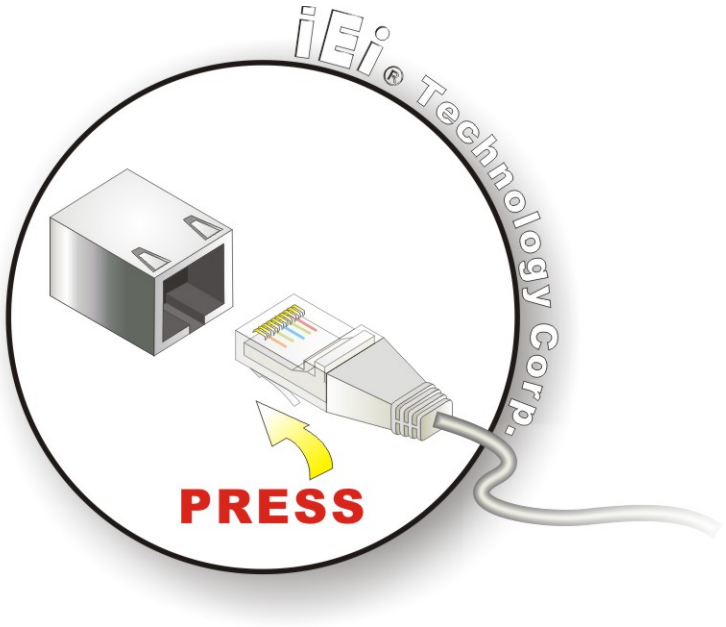


Figure 4-18: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

4.8.2 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the NANO-GM45A2.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 4-19**.

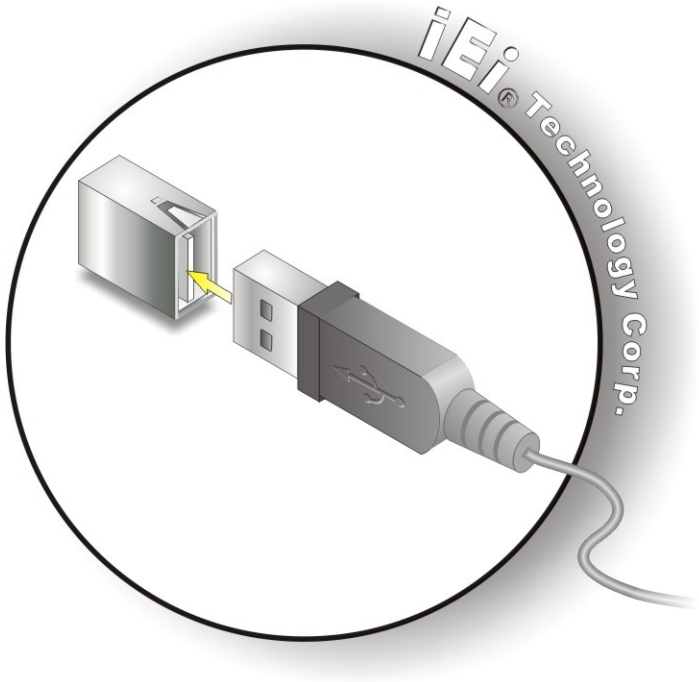


Figure 4-19: USB Connector

4.8.3 VGA Monitor Connection

The NANO-GM45A2 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the NANO-GM45A2, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the NANO-GM45A2. See **Figure 4-20**.

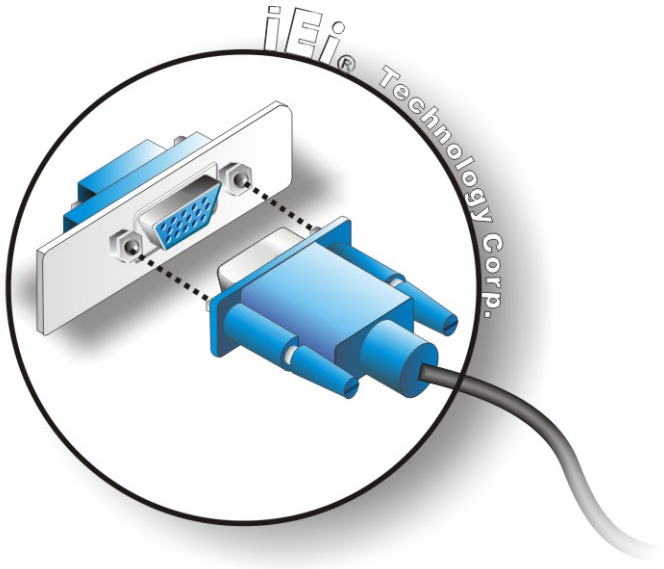


Figure 4-20: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.9 Software Installation

All the drivers for the NANO-GM45A2 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the installation program doesn't start automatically:
Click "Start->My Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (**Figure 4-21**).

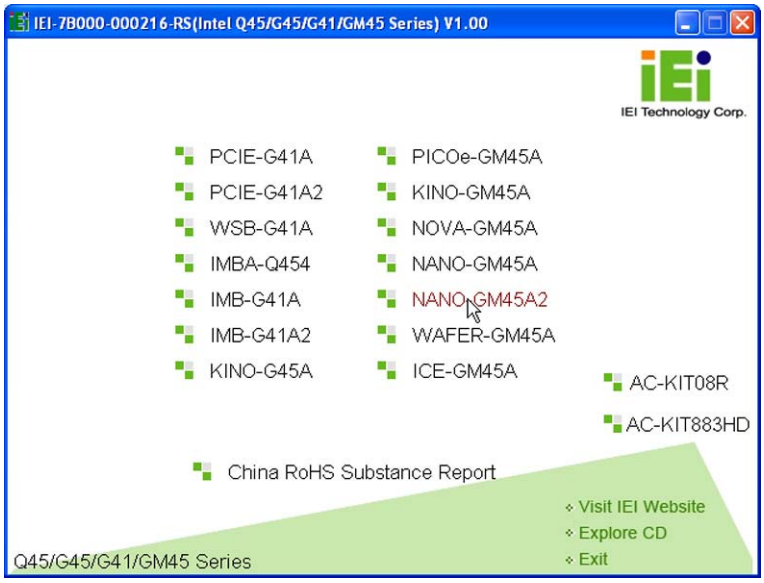


Figure 4-21: Introduction Screen

Step 3: Click **NANO-GM45A2**.

Step 4: A new screen with a list of available drivers appears (**Figure 4-22**).

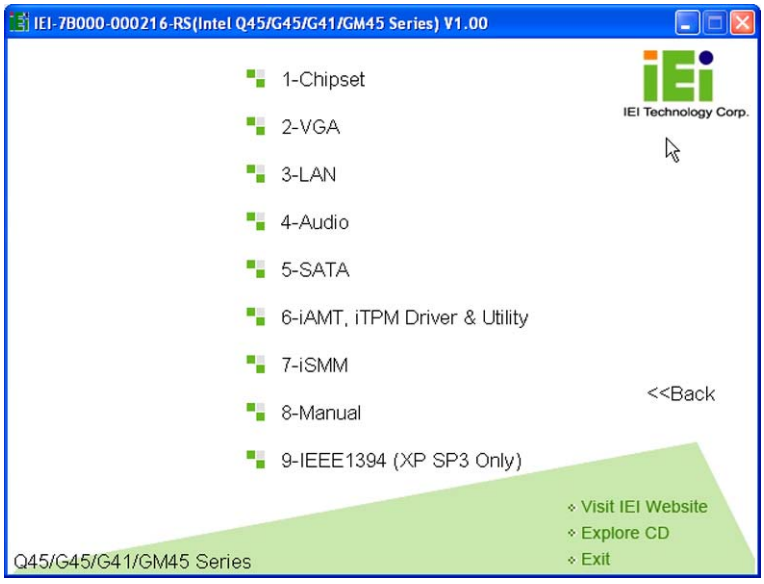


Figure 4-22: Available Drivers

Step 5: Install all of the necessary drivers in this menu.

Chapter

5

BIOS Screens

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **5**.

5.1.5 BIOS Menu Bar

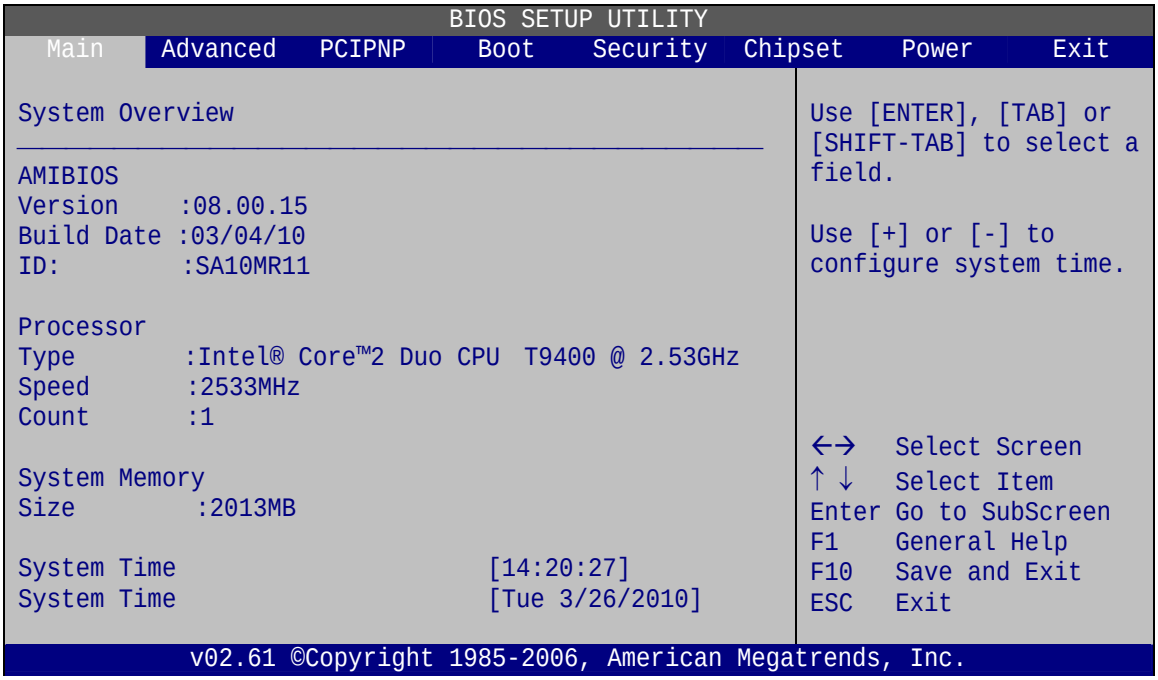
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Power – Changes power management settings.
- Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- AMI BIOS: Displays auto-detected BIOS information
  - **Version:** Current BIOS version
  - **Build Date:** Date the current BIOS version was made
  - **ID:** Installed BIOS ID
- Processor: Displays auto-detected CPU specifications
  - **Type:** Names the currently installed processor
  - **Speed:** Lists the processor speed
  - **Count:** The number of CPUs on the motherboard
- System Memory: Displays the auto-detected system memory.
  - **Size:** Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

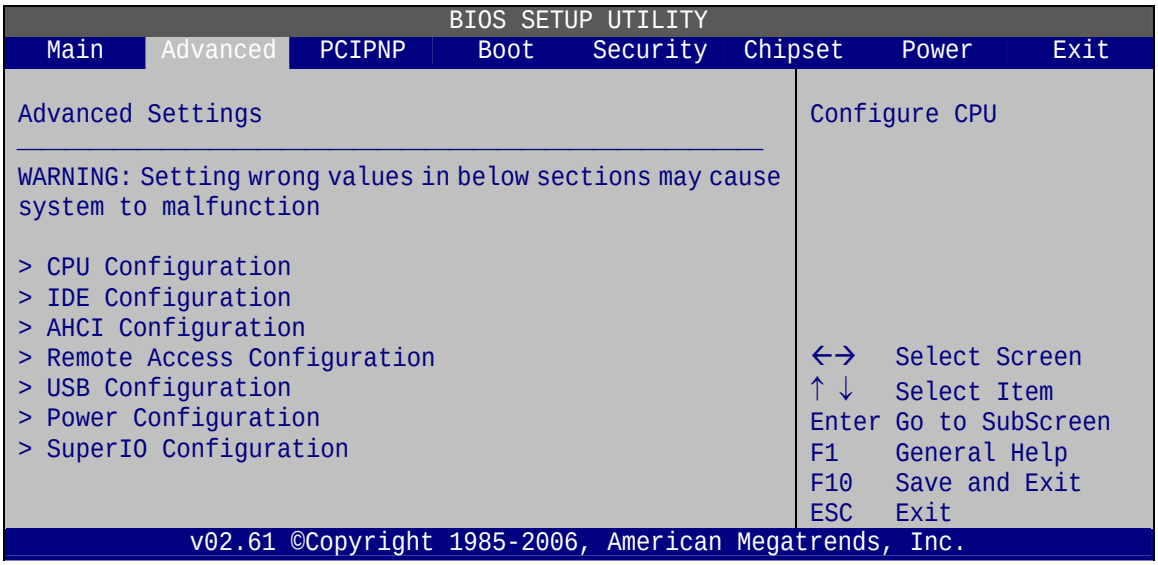
5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

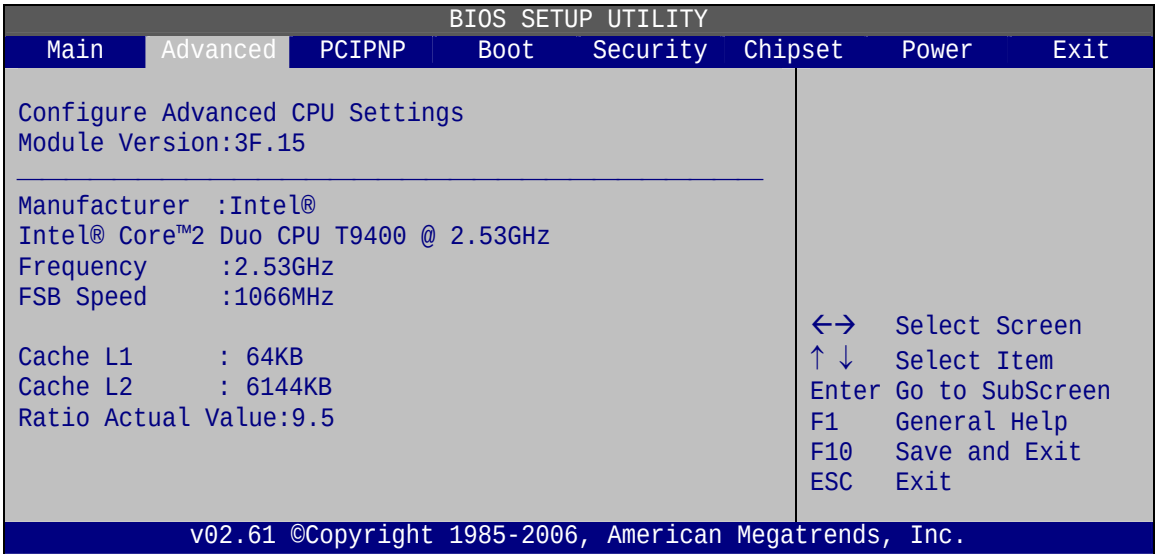
- CPU Configuration (see **Section 5.3.1**)
- IDE Configuration (see **Section 5.3.2**)
- AHCI Configuration (see **Section 5.3.3**)
- Remote Access Configuration (see **Section 5.3.4**)
- USB Configuration (see **Section 5.3.5**)
- Power Configuration (see **Section 5.3.6**)
- Super IO Configuration (see **Section 5.3.7**)



BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 3: CPU Configuration

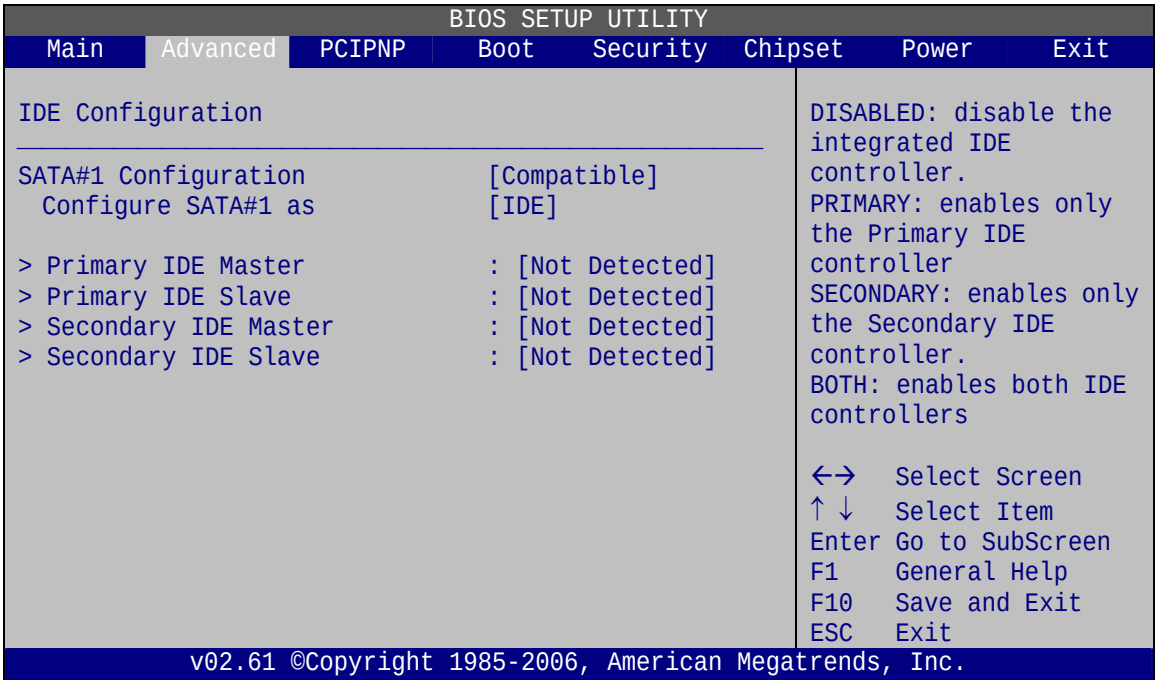
The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer
- Brand String: Lists the brand name of the CPU being used

- Frequency: Lists the CPU processing speed
- FSB Speed: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
IDE Configuration
SATA#1 Configuration [Compatible]
Configure SATA#1 as [IDE]
> Primary IDE Master : [Not Detected]
> Primary IDE Slave : [Not Detected]
> Secondary IDE Master : [Not Detected]
> Secondary IDE Slave : [Not Detected]
DISABLED: disable the integrated IDE controller.
PRIMARY: enables only the Primary IDE controller
SECONDARY: enables only the Secondary IDE controller.
BOTH: enables both IDE controllers
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 4: IDE Configuration

➔ **SATA#1 Configurations [Compatible]**

Use the **SATA#1 Configurations** option to configure the ATA/IDE controller.

➔ **Disabled** Disables the on-board ATA/IDE controller.

➔ **Compatible** **DEFAULT** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **AHCI** Configures SATA devices as normal AHCI device.

➔ **IDE Master and IDE Slave**

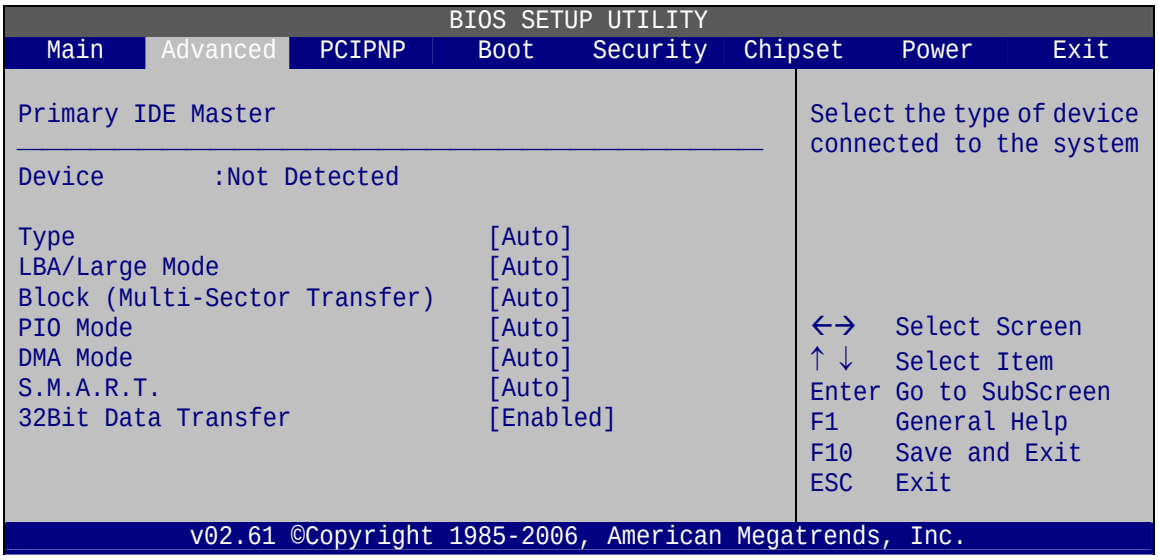
When entering setup, BIOS automatically detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

- 32Bit Data Transfer: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ZIP LS-120

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**		BIOS is prevented from using the LBA mode control on the specified channel.
➔ **Auto**	**DEFAULT**	BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**		BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
➔ **Auto**	**DEFAULT**	BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	**DEFAULT**	BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
➔ **0**		PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s
➔ **1**		PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s
➔ **2**		PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s
➔ **3**		PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔ **SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s
➔ **SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s
➔ **SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s
➔ **MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s
➔ **MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s
➔ **MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s
➔ **UDMA0**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s
➔ **UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s
➔ **UDMA2**		Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s
➔ **UDMA3**		Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA4**		Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA5**		Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	**DEFAULT**	BIOS auto detects HDD SMART support.
➔ **Disabled**		Prevents BIOS from using the HDD SMART feature.
➔ **Enabled**		Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

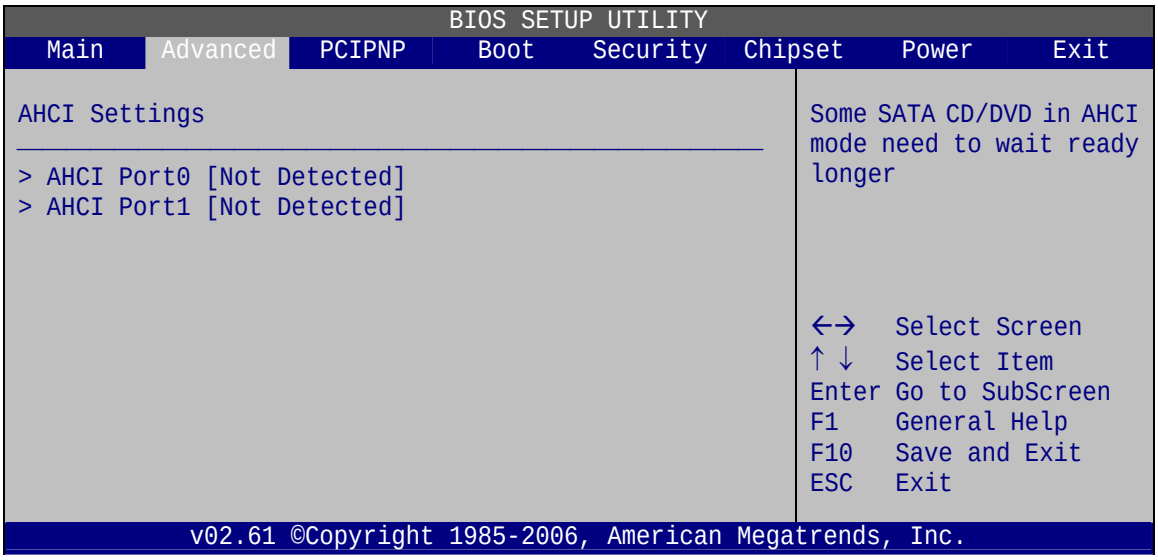
➔ **Disabled**		Prevents the BIOS from using 32-bit data transfers.
➔ **Enabled**	**DEFAULT**	Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 AHCI Configuration

NOTE:

Advanced Host Controller Interface (AHCI) is a new programming interface for SATA host controllers. AHCI systems do not have master/slave designation for SATA devices, each device is treated as a master, and hardware-assisted native command queuing.

Use the **AHCI Settings** menu (**BIOS Menu 6**) to report on the auto-detection of devices connected to the onboard SATA drive connectors.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
AHCI Settings
> AHCI Port0 [Not Detected]
> AHCI Port1 [Not Detected]
Some SATA CD/DVD in AHCI mode need to wait ready longer
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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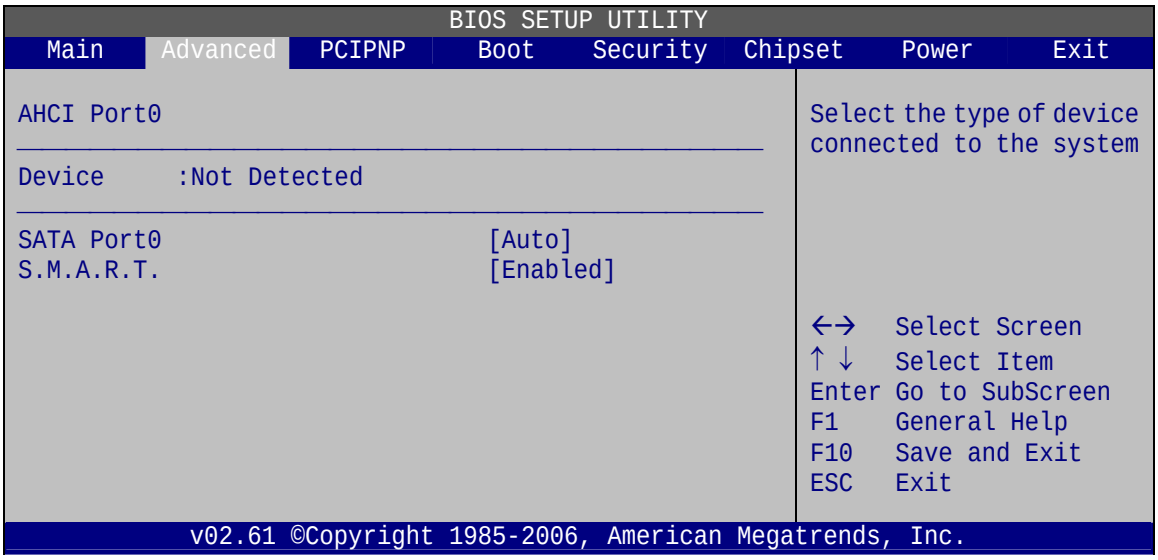
BIOS Menu 6: AHCI Configuration

➔ **AHCI Port n [Not Detected]**

Use the **AHCI Port n** BIOS option to check what AHCI (Advanced Host Controller Interface) devices are detected to a specified SATA drive connector. If a device is detected, selecting the BIOS option, e.g. "**AHCI Port 3**" opens a new window.

5.3.3.1 AHCI Port n

Use the **AHCI Port n** configuration menu (**BIOS Menu 7**) to configure the drive connected to SATA connector n.



BIOS Menu 7: AHCI Port n Configuration Menu

➔ **SATA Port n [Auto]**

Use the **SATA Port n** option to enable the system to auto-detect the type of drive connected to SATA drive connector n.

➔ **S.M.A.R.T [Enabled]**

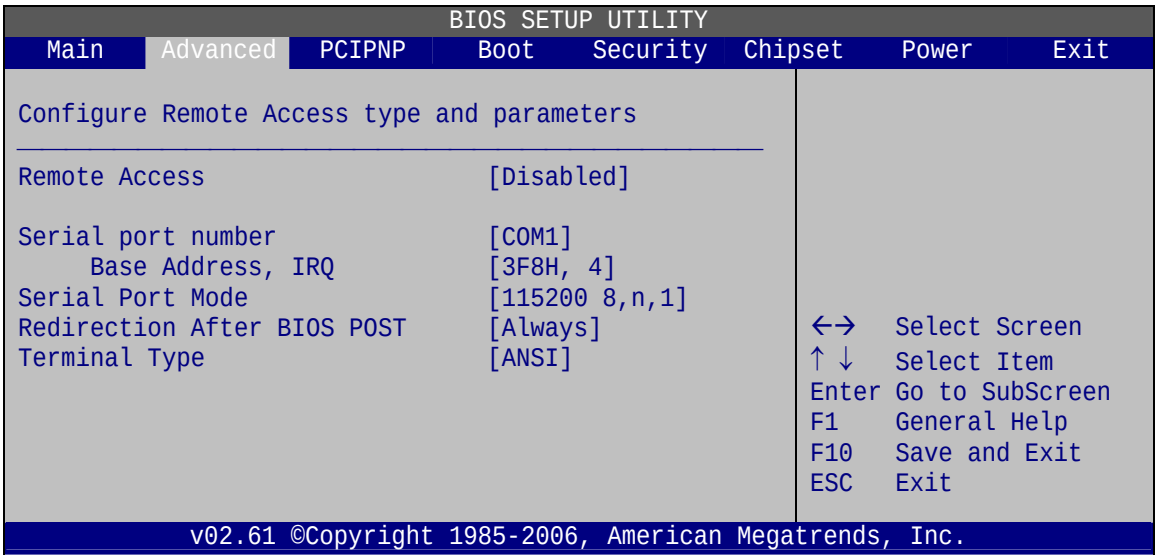
Use the **S.M.A.R.T** option to enable S.M.A.R.T (Self-Monitoring, Analysis, and Reporting Technology) on the drive connected to SATA drive connector n.

➔ **Enabled** **DEFAULT** S.M.A.R.T is enabled on the drive connected to SATA drive connector n on the system

➔ **Disabled** S.M.A.R.T is disabled on the drive connected to SATA drive connector n on the system

5.3.4 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 8**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Configure Remote Access type and parameters
Remote Access [Disabled]
Serial port number [COM1]
Base Address, IRQ [3F8H, 4]
Serial Port Mode [115200 8,n,1]
Redirection After BIOS POST [Always]
Terminal Type [ANSI]
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 8: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below appear:

- Serial Port Number
- Serial Port Mode
- Redirection after BIOS POST
- Terminal Type

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option to select the serial port used for remote access.

➔ **COM1** **DEFAULT** System is remotely accessed through COM1

➔ **COM2** System is remotely accessed through COM2

➔ **COM3** System is remotely accessed through COM3

➔ **COM4** System is remotely accessed through COM4

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3E8h, A]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled** The console is not redirected after POST

➔ **Boot Loader** Redirection is active during POST and during Boot Loader

➔ **Always** **DEFAULT** Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

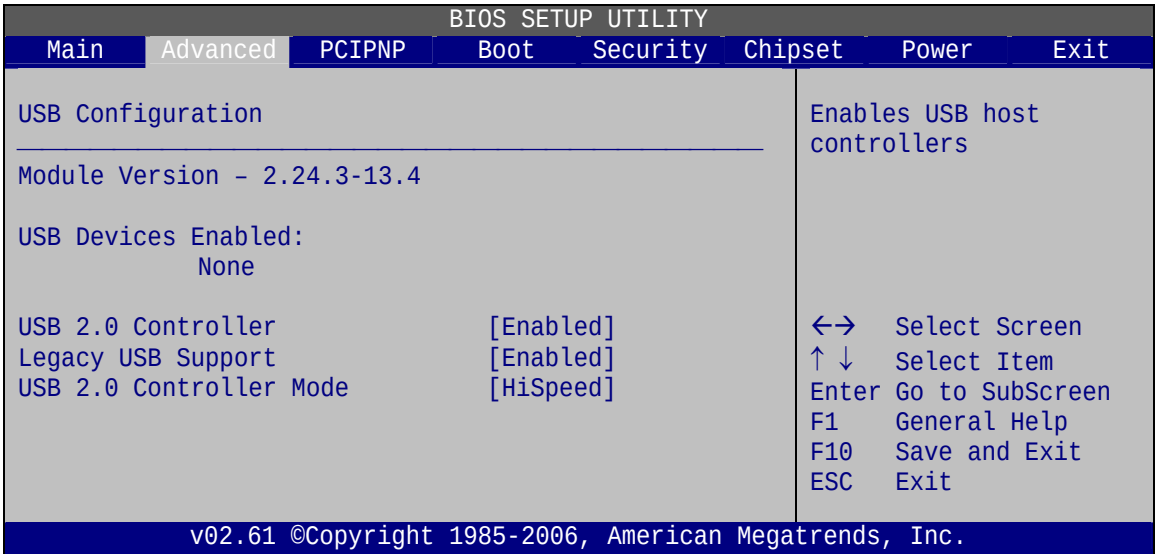
➔ **ANSI** **DEFAULT** The target terminal type is ANSI

➔ **VT100** The target terminal type is VT100

➔ **VT-UTF8** The target terminal type is VT-UTF8

5.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 9**) to read USB configuration information and configure the USB settings.



BIOS Menu 9: USB Configuration

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option is enabled.

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

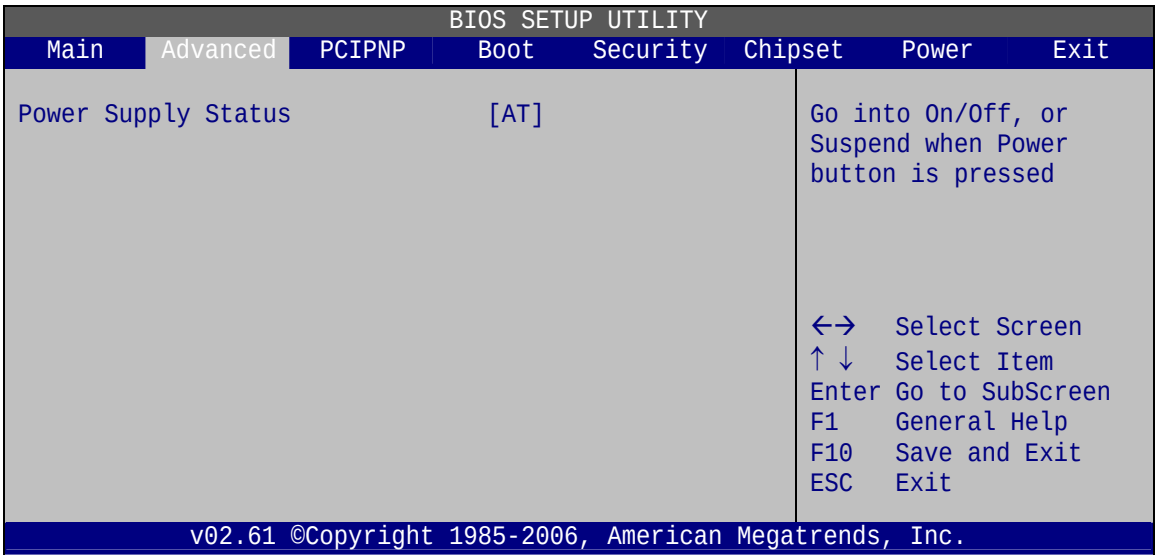
➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed**		The controller is capable of operating at 12 Mb/s
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at 480 Mb/s

5.3.6 Power Configuration

The **Power Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Power Supply Status [AT]
Go into On/Off, or Suspend when Power button is pressed
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 10: APM Configuration

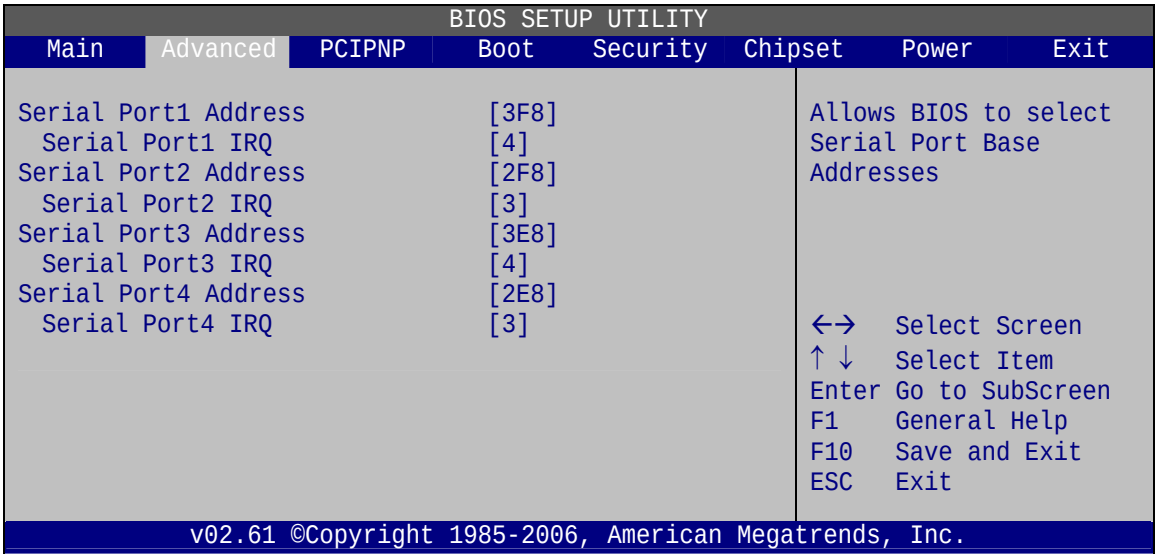
➔ **Power Supply Status [By Hardware]**

Use the **Power Supply Status** BIOS option to select the power supply that is connected to the system.

➔ **AT**		An AT power supply is connected to the system
➔ **ATX**		An ATX power supply is connected to the system
➔ **BY HARDWARE**	**DEFAULT**	The power supply mode is set by on-board jumper.

5.3.7 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 11**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Serial Port1 Address [3F8]
Serial Port1 IRQ [4]
Serial Port2 Address [2F8]
Serial Port2 IRQ [3]
Serial Port3 Address [3E8]
Serial Port3 IRQ [4]
Serial Port4 Address [2E8]
Serial Port4 IRQ [3]
Allows BIOS to select Serial Port Base Addresses
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 11: Super IO Configuration

➔ **Serial Port1 Address [3F8]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8**	**DEFAULT**	Serial Port 1 I/O port address is 3F8
➔ **2F8**		Serial Port 1 I/O port address is 2F8

➔ **Serial Port1 IRQ [10]**

Use the **Serial Port1 IRQ** option to select the interrupt address for serial port 1.

➔ **4**	Serial port 1 IRQ address is 4
➔ **3**	Serial port 1 IRQ address is 3

➔ **Serial Port2 Address [2F8]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

- **Disabled** No base address is assigned to Serial Port 2
- **3F8** Serial Port 2 I/O port address is 3F8
- **2F8** Serial Port 2 I/O port address is 2F8

Serial Port2 IRQ [3]

Use the **Serial Port2 IRQ** option to select the interrupt address for serial port 2.

- **4** Serial port 2 IRQ address is 4
- **3** Serial port 2 IRQ address is 3

Serial Port3 Address [3E8]

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

- **Disabled** No base address is assigned to serial port 3
- **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8
- **2E8** Serial port 3 I/O port address is 2E8

Serial Port3 IRQ [4]

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- **4** **DEFAULT** Serial port 3 IRQ address is 4
- **3** Serial port 3 IRQ address is 3
- **10** Serial port 3 IRQ address is 10
- **11** Serial port 3 IRQ address is 11

Serial Port4 Address [2E8]

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- **Disabled** No base address is assigned to serial port 4
- **3E8** Serial port 4 I/O port address is 3E8

➔ **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8

➔ **Serial Port4 IRQ [4]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

➔ **4** **DEFAULT** Serial port 4 IRQ address is 4

➔ **3** Serial port 1 IRQ address is 3

➔ **10** Serial port 1 IRQ address is 10

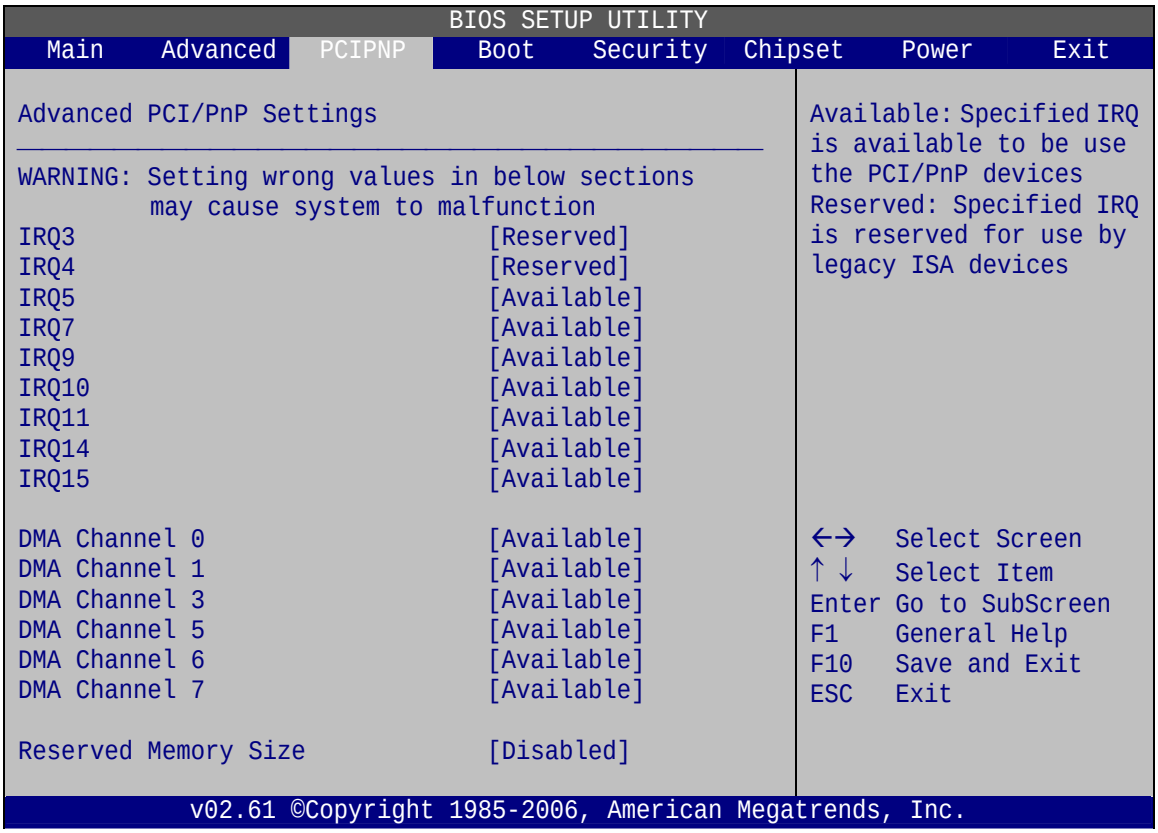
➔ **11** Serial port 1 IRQ address is 11

5.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 12**) to configure advanced PCI and PnP settings.

WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Advanced PCI/PnP Settings
WARNING: Setting wrong values in below sections
may cause system to malfunction
IRQ3 [Reserved]
IRQ4 [Reserved]
IRQ5 [Available]
IRQ7 [Available]
IRQ9 [Available]
IRQ10 [Available]
IRQ11 [Available]
IRQ14 [Available]
IRQ15 [Available]
DMA Channel 0 [Available]
DMA Channel 1 [Available]
DMA Channel 3 [Available]
DMA Channel 5 [Available]
DMA Channel 6 [Available]
DMA Channel 7 [Available]
Reserved Memory Size [Disabled]
Available: Specified IRQ is available to be use the PCI/PnP devices
Reserved: Specified IRQ is reserved for use by legacy ISA devices
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 12: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7

- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

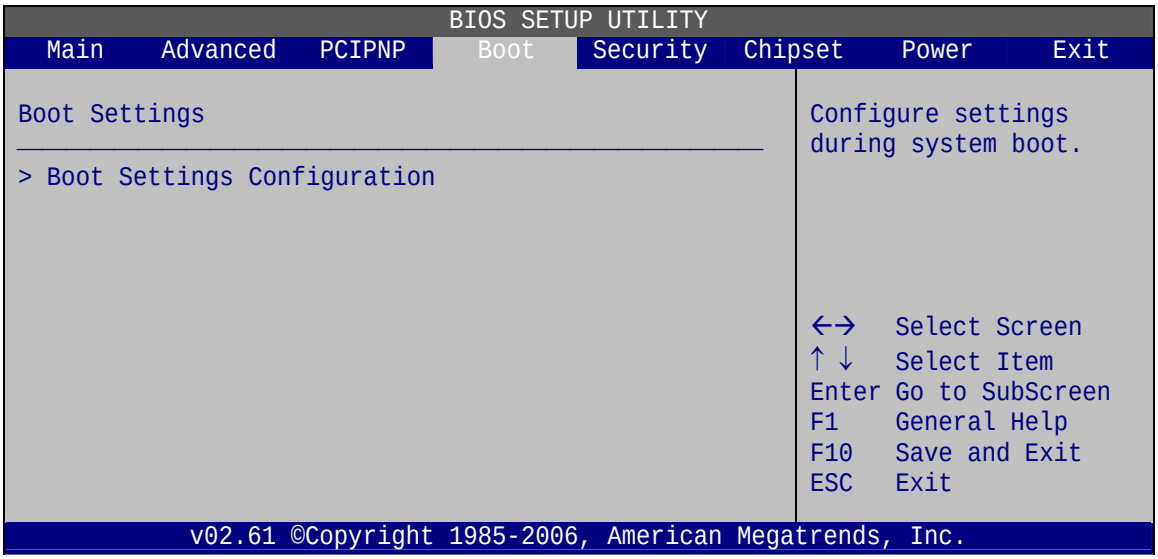
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔ **16K**		16 KB reserved for legacy ISA devices
➔ **32K**		32 KB reserved for legacy ISA devices
➔ **64K**		54 KB reserved for legacy ISA devices

5.5 Boot

Use the **Boot** menu (**BIOS Menu 13**) to configure system boot options.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Boot Settings
> Boot Settings Configuration
Configure settings during system boot.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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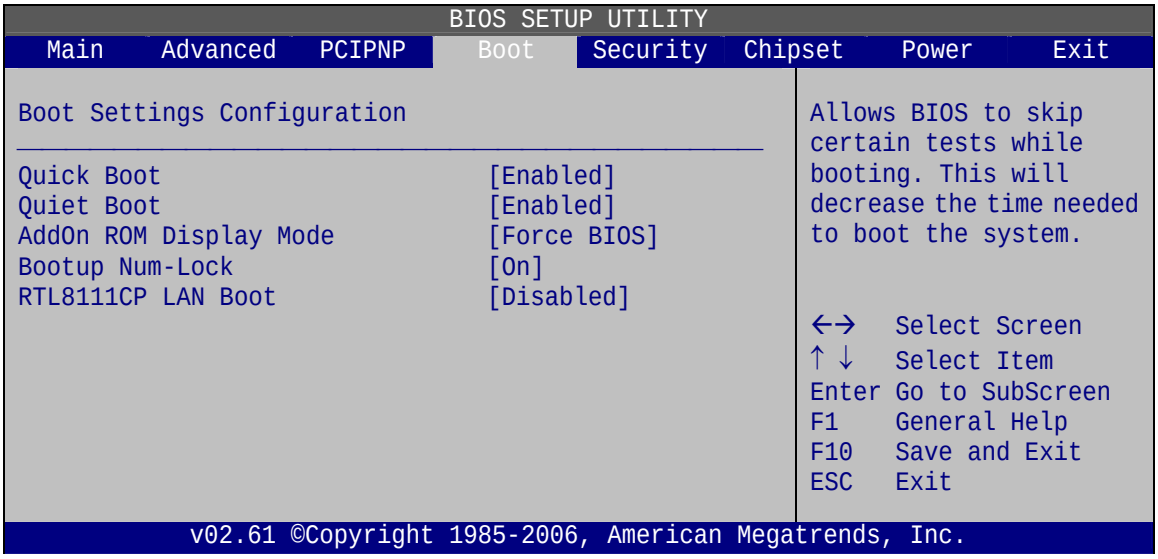
BIOS Menu 13: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 14**) to configure advanced system boot options.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Enabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
RTL8111CP LAN Boot [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 14: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**		Normal POST messages displayed
➔ **Enabled**	**DEFAULT**	OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	The system forces third party BIOS to display during system boot.
➔ **Keep Current**		The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off**	Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **RTL8111CP LAN Boot [Disabled]**

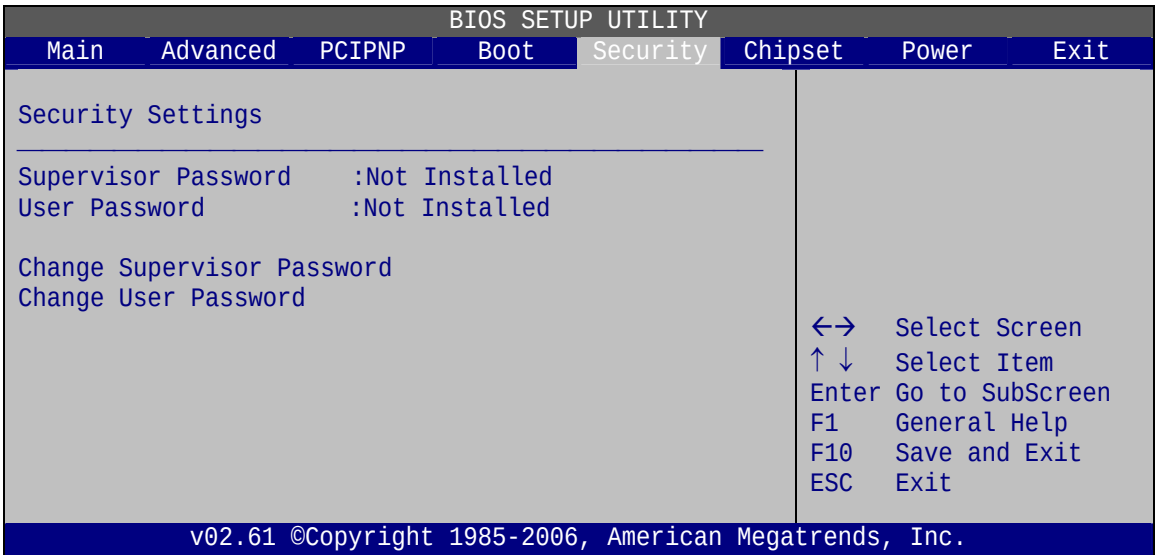
Use the **RTL8111CP LAN Boot** option to enable the Realtek RTL8111CP PCIe GbE controller to boot the system.

➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the Realtek RTL8111CP PCIe GbE controller

➔ **Enabled** Can be booted from a remote system through the Realtek RTL8111CP PCIe GbE controller

5.6 Security

Use the **Security** menu (**BIOS Menu 15**) to set system and user passwords.



BIOS Menu 15: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

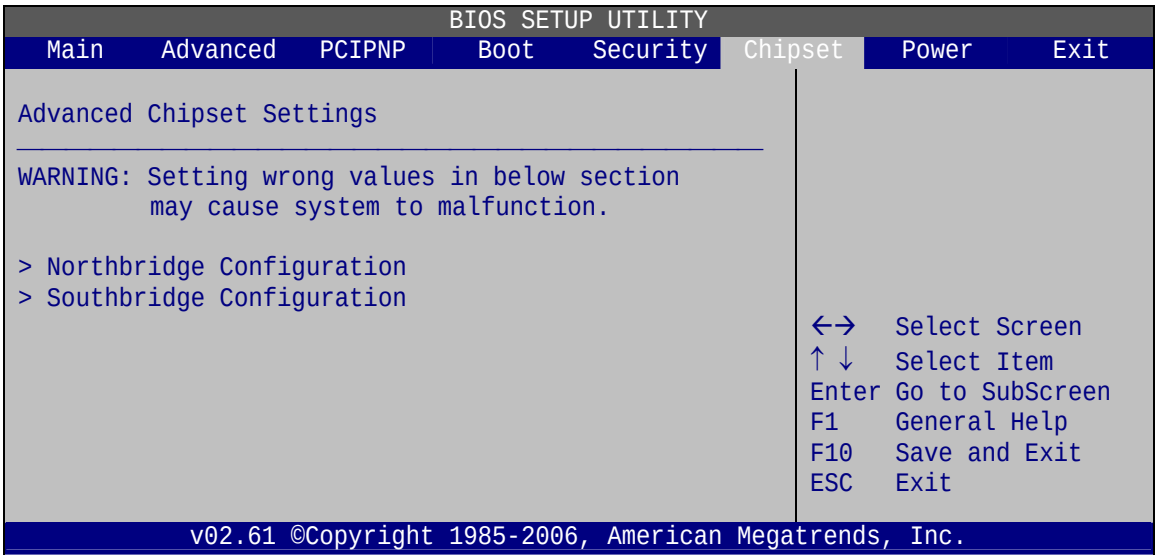
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 16**) to access the Northbridge and Southbridge configuration menus

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below section
may cause system to malfunction.
> Northbridge Configuration
> Southbridge Configuration
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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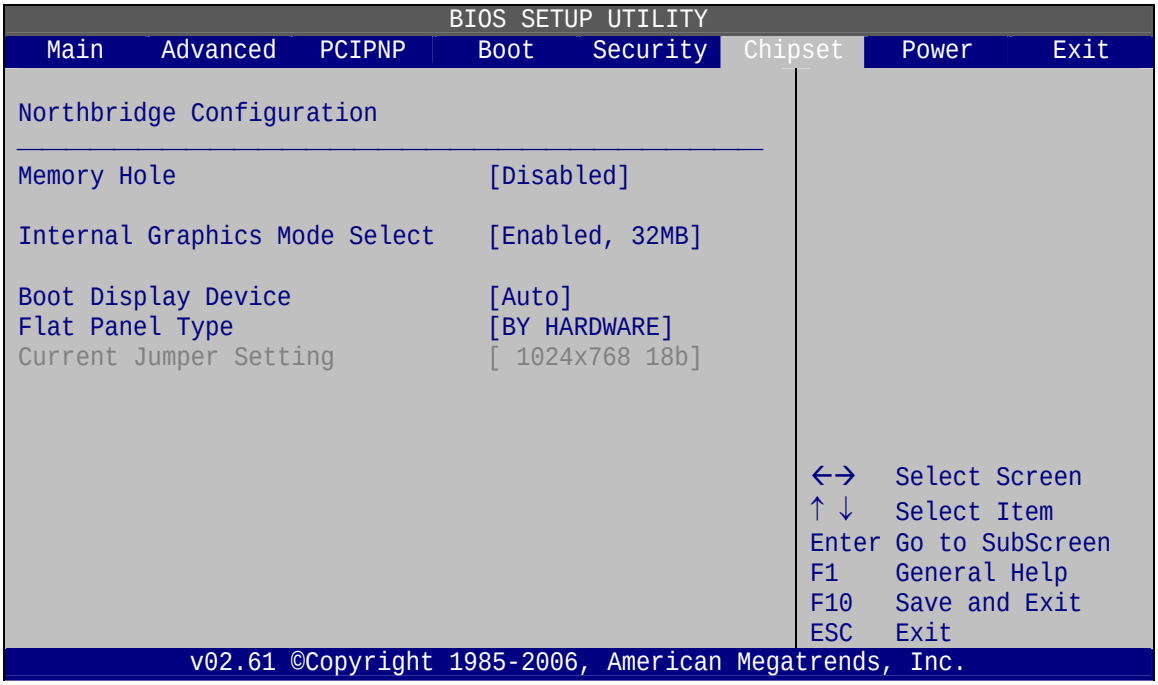
BIOS Menu 16: Chipset

5.7.1 Northbridge Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 17**) to configure the Northbridge chipset.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Northbridge Configuration
Memory Hole [Disabled]
Internal Graphics Mode Select [Enabled, 32MB]
Boot Display Device [Auto]
Flat Panel Type [BY HARDWARE]
Current Jumper Setting [1024x768 18b]
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 17:Northbridge Chipset Configuration

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15 MB and 16 MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled**	**DEFAULT**	Memory is not reserved for ISA expansion cards
➔ **15 MB – 16 MB**		Between 15 MB and 16 MB of memory is reserved for ISA expansion cards

➔ **Internal Graphics Mode Select [Enable, 32 MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **Enable, 32 MB**	**DEFAULT**	32 MB of memory used by internal graphics device
➔ **Enable, 64 MB**		64 MB of memory used by internal graphics device
➔ **Enable, 128 MB**		128 MB of memory used by internal graphics device

➔ **Boot Display Device [Auto]**

Use the **Boot Display Device** BIOS feature to determine what displays are used. Dual display functionality is enabled here. Dual display configuration options are listed below:

- Auto **DEFAULT**
- CRT
- TV
- HDMI
- LVDS

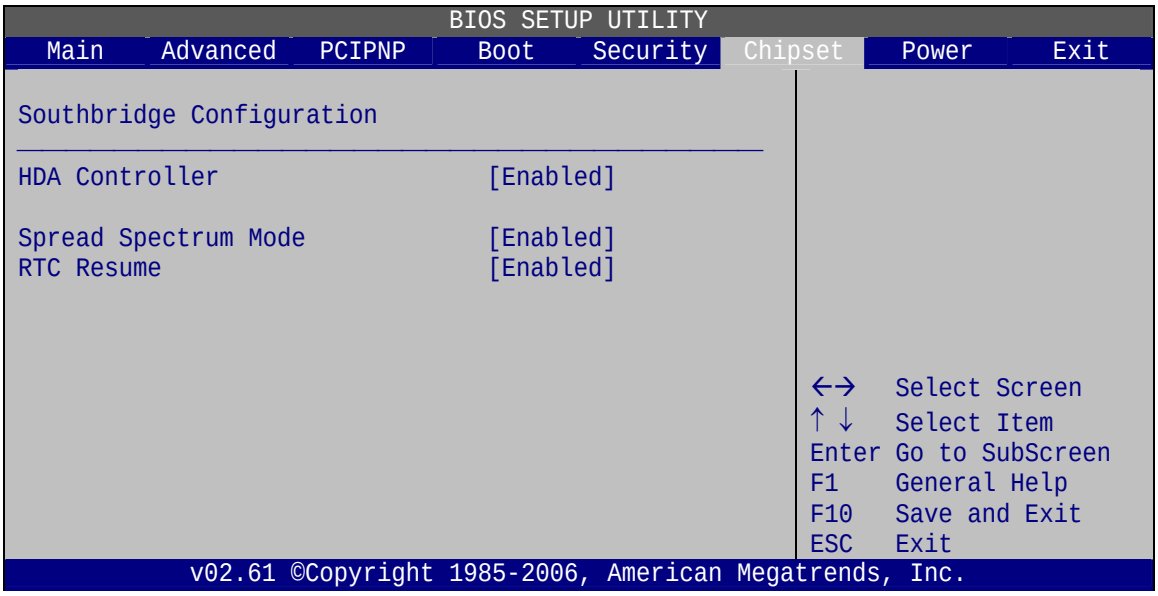
➔ **Flat Panel Type**

Use the **Flat Panel Type** to determine the LCD panel resolution. Configuration options are listed below:

- 640 x 480 18b
- 800 x 600 18b
- 1024 x 768 18b
- 1280 x 768 24b
- 1280 x 1024 48b
- 1600 x 1200 48b
- BY HARDWARE

5.7.2 Southbridge Configuration

Use the **Southbridge Configuration** menu (**BIOS Menu 18**) to configure the Southbridge chipset.



BIOS Menu 18:Southbridge Chipset Configuration

➔ **HDA Controller [Enabled]**

Use the **HDA Controller** option to enable or disable the High Definition Audio controller.

➔ **Enabled** **DEFAULT** The onboard High Definition Audio controller automatically detected and enabled

➔ **Disabled** The onboard High Definition Audio controller is disabled

➔ **RTC Resume [Disabled]**

Use the **RTC Resume** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the following appears with values that can be selected:

- ➔ **RTC Alarm Date (Days)**
- ➔ **System Time**

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

➔ **Spread Spectrum [Enabled]**

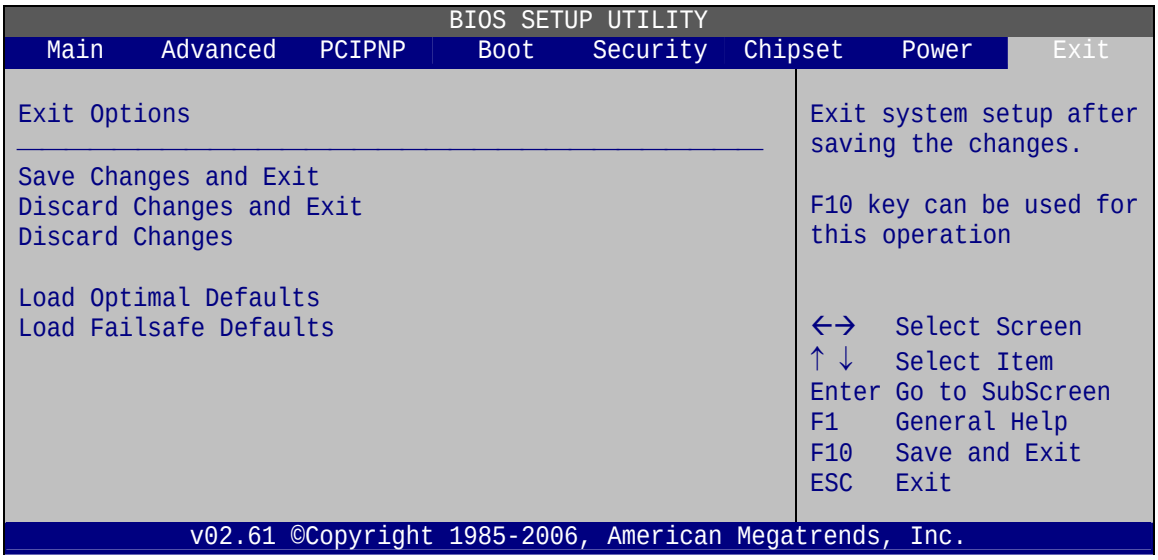
Use the **Spread Spectrum** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled** EMI not reduced

➔ **Enabled** **DEFAULT** EMI reduced

5.8 Exit

Use the **Exit** menu (**BIOS Menu 19**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 19:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix

A

BIOS Menu Options

Below is a list of BIOS configuration options in the BIOS chapter.

System Overview 65
System Time [xx:xx:xx] 66
System Date [xx/xx/xx] 66
SATA#1 Configurations [Compatible] 68
Configure SATA as [IDE] 69
IDE Master and IDE Slave 69
Auto-Detected Drive Parameters 70
Type [Auto] 71
LBA/Large Mode [Auto] 71
Block (Multi Sector Transfer) [Auto] 72
PIO Mode [Auto] 72
DMA Mode [Auto] 72
S.M.A.R.T [Auto] 74
32Bit Data Transfer [Enabled] 74
AHCI Port n [Not Detected] 75
SATA Port n [Auto] 76
S.M.A.R.T [Enabled] 76
Remote Access [Disabled] 77
Serial Port Number [COM1] 77
Base Address, IRQ [3E8h, A] 78
Serial Port Mode [115200 8,n,1] 78
Redirection After BIOS POST [Always] 78
Terminal Type [ANSI] 79
USB Configuration 79
USB Devices Enabled 80
USB 2.0 Controller [Enabled] 80
Legacy USB Support [Enabled] 80
USB2.0 Controller Mode [HiSpeed] 80
Power Supply Status [By Hardware] 81
Serial Port1 Address [3F8] 82
Serial Port1 IRQ [10] 82
Serial Port2 Address [2F8] 82

Serial Port2 IRQ [3] 83
Serial Port3 Address [3E8] 83
Serial Port3 IRQ [4] 83
Serial Port4 Address [2E8] 83
Serial Port4 IRQ [4] 84
IRQ# [Available] 85
DMA Channel# [Available] 86
Reserved Memory Size [Disabled] 86
Quick Boot [Enabled] 88
Quiet Boot [Enabled] 88
AddOn ROM Display Mode [Force BIOS] 88
Bootup Num-Lock [On] 88
RTL8111CP LAN Boot [Disabled] 89
Change Supervisor Password 90
Change User Password 90
Memory Hole [Disabled] 92
Internal Graphics Mode Select [Enable, 32 MB] 92
Boot Display Device [Auto] 92
Flat Panel Type 93
HDA Controller [Enabled] 93
RTC Resume [Disabled] 94
RTC Alarm Date (Days) 94
System Time 94
Spread Spectrum [Enabled] 94
Save Changes and Exit 95
Discard Changes and Exit 95
Discard Changes 95
Load Optimal Defaults 95
Load Failsafe Defaults 95

Appendix

B

One Key Recovery

B.1 One Key Recovery Introduction

The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. The one key recovery provides quick and easy shortcuts for creating a backup and reverting to that backup or for reverting to the factory default settings.

The IEI One Key Recovery tool menu is shown below.

Figure B-1: IEI One Key Recovery Tool Menu

Prior to using the IEI One Key Recovery tool (as shown in **Figure B-1**) to backup or restore Windows system, five setup procedures are required.

1. Hardware and BIOS setup (see **Section B.2.1**)
2. Create partitions (see **Section B.2.2**)
3. Install operating system, drivers and system applications (see **Section B.2.3**)
4. Build-up recovery partition (see **Section B.2.4**)
5. Create factory default image (see **Section B.2.5**)

After completing the five initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The detailed information of each function is described in **Section B.4**.

NOTE:

The initial setup procedures for Linux system are described in **Section B.3**.

B.1.1 System Requirement

NOTE:

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the partitions. Please take the following table as a reference when calculating the size of the partition.

	OS	OS Image after Ghost	Compression Ratio
Windows® 7	7 GB	5 GB	70%
Windows® XPE	776 MB	560 MB	70%
Windows® CE 6.0	36 MB	28 MB	77%

NOTE:

Specialized tools are required to change the partition size if the operating system is already installed.

B.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating system (OS). The supported OS versions are listed below.

- Microsoft Windows
  - Windows XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
- Linux
  - Fedora Core 12 (Constantine)
  - Fedora Core 11 (Leonidas)
  - Fedora Core 10 (Cambridge)
  - Fedora Core 8 (Werewolf)
  - Fedora Core 7 (Moonshine)
  - RedHat RHEL-5.4
  - RedHat 9 (Ghirke)
  - Ubuntu 8.10 (Intrepid)
  - Ubuntu 7.10 (Gutsy)
  - Ubuntu 6.10 (Edgy)
  - Debian 5.0 (Lenny)
  - Debian 4.0 (Etch)
  - SuSe 11.2
  - SuSe 10.3

NOTE:

Installing unsupported OS versions may cause the recovery tool to fail.

B.2 Setup Procedure for Windows

Prior to using the recovery tool to backup or restore Windows system, a few setup procedures are required.

Step 1: Hardware and BIOS setup (see **Section B.2.1**)

Step 2: Create partitions (see **Section B.2.2**)

Step 3: Install operating system, drivers and system applications (see **Section B.2.3**)

Step 4: Build-up recovery partition (see **Section B.2.4**)

Step 5: Create factory default image (see **Section B.2.5**)

The detailed descriptions are described in the following sections.

NOTE:

The setup procedures described below are for Microsoft Windows operating system users. For Linux system, most setup procedures are the same with Microsoft Windows except for several steps described in **Section B.3**.

B.2.1 Hardware and BIOS Setup

Step 1: Make sure the system is powered off and unplugged.

Step 2: Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.

Step 3: Connect an optical disk drive to the system and insert the recovery CD.

Step 4: Turn on the system.

Step 5: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 6: Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).

Step 7: Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

B.2.2 Create Partitions

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

Step 1: Put the recovery CD in the optical drive of the system.

Step 2: **Boot the system from recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

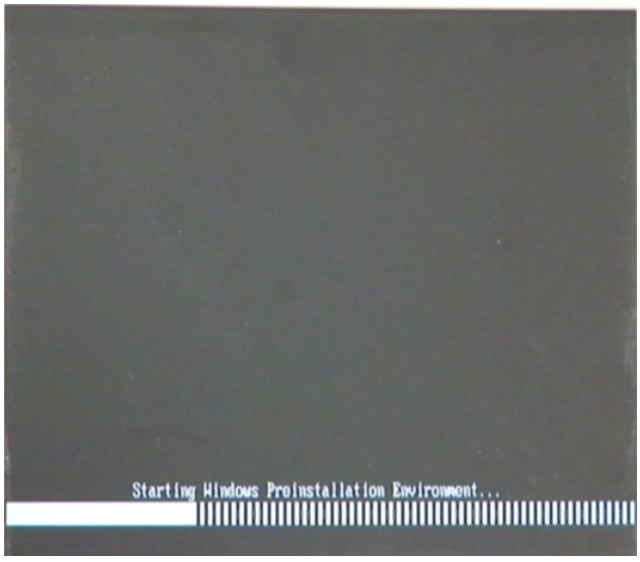


Figure B-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.

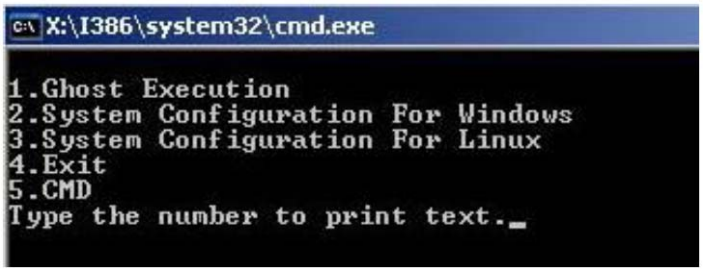


Figure B-3: Recovery Tool Setup Menu

Step 4: Press <**5**> then <Enter>.

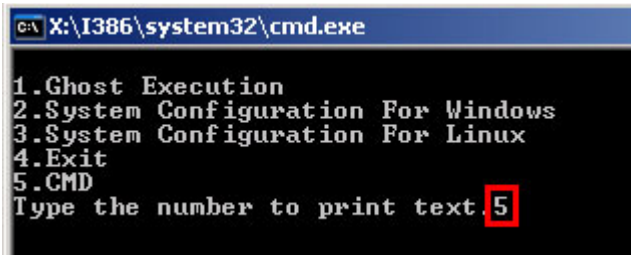


Figure B-4: Command Mode

Step 5: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition.

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>create part pri size= ___

DISKPART>assign letter=F

DISKPART>exit

system32>format N: /fs:ntfs /q /y

system32>format F: /fs:ntfs /q /v:Recovery /y

system32>exit

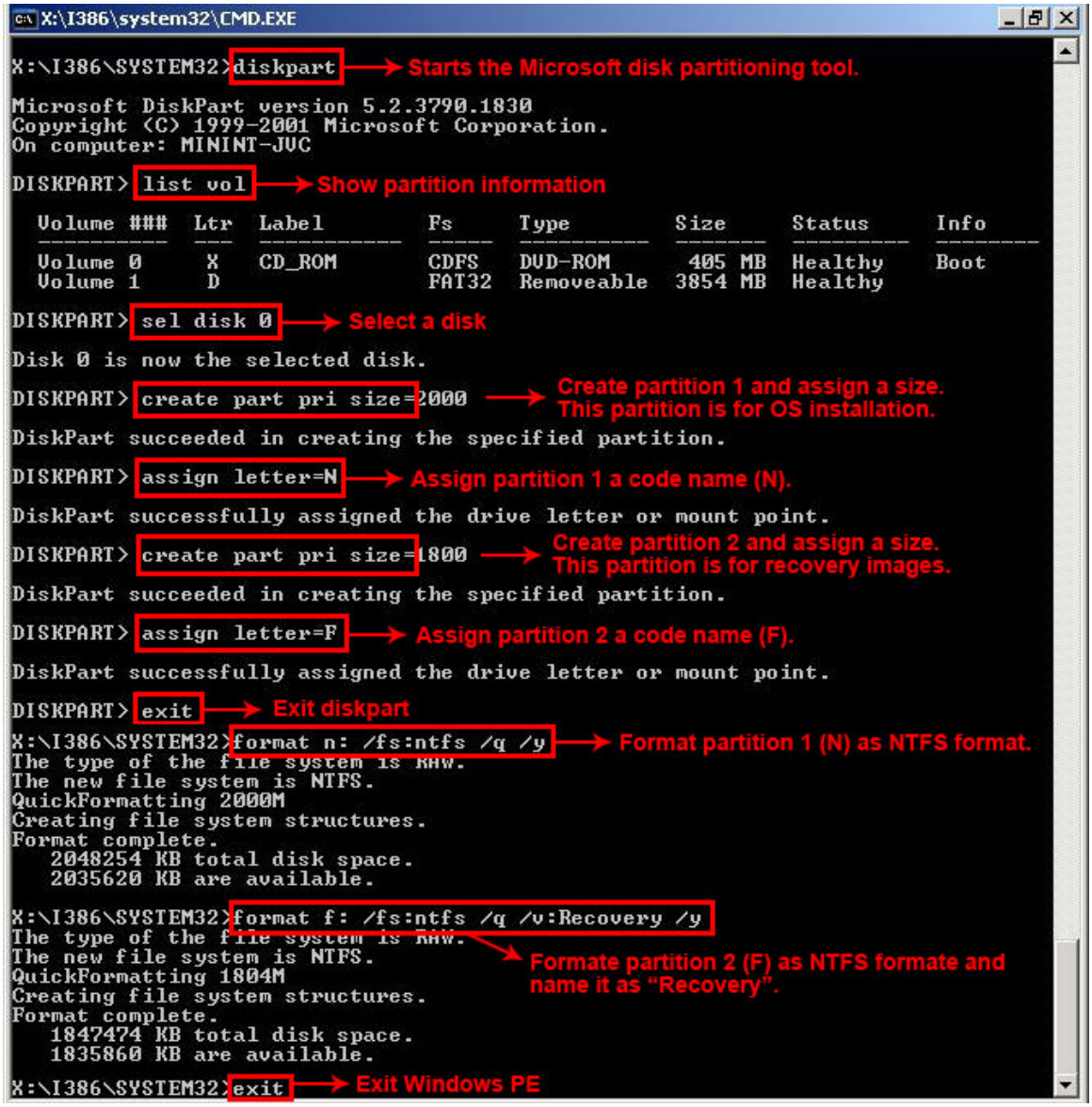
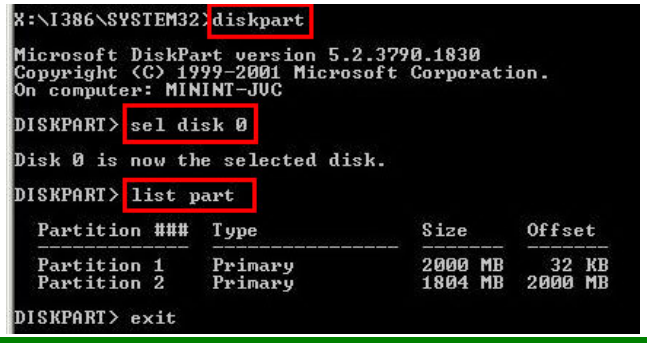

X:\I386\system32\CMD.EXE
X:\I386\SYSTEM32>diskpart
Starts the Microsoft disk partitioning tool.
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC
DISKPART> list vol
Show partition information
Volume ### Ltr Label Fs Type Size Status Info
Volume 0 X CD_ROM CDFS DVD-ROM 405 MB Healthy Boot
Volume 1 D FAT32 Removeable 3854 MB Healthy
DISKPART> sel disk 0
Select a disk
Disk 0 is now the selected disk.
DISKPART> create part pri size=2000
Create partition 1 and assign a size.
This partition is for OS installation.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=N
Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> create part pri size=1800
Create partition 2 and assign a size.
This partition is for recovery images.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=F
Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> exit
Exit diskpart
X:\I386\SYSTEM32>format n: /fs:ntfs /q /y
Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
2048254 KB total disk space.
2035620 KB are available.
X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
1847474 KB total disk space.
1835860 KB are available.
Formate partition 2 (F) as NTFS formate and
name it as "Recovery".
X:\I386\SYSTEM32>exit
Exit Windows PE

Figure B-5: Partition Creation Commands

NOTE:

Use the following commands to check if the partitions were created successfully.


X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC
DISKPART> sel disk 0
Disk 0 is now the selected disk.
DISKPART> list part
Partition ### Type Size Offset
Partition 1 Primary 2000 MB 32 KB
Partition 2 Primary 1804 MB 2000 MB
DISKPART> exit

Step 6: Press any key to exit the recovery tool and automatically reboot the system.

Please continue to the following procedure: Build-up Recovery Partition.

B.2.3 Install Operating System, Drivers and Applications

Install the operating system onto the unlabelled partition. The partition labeled as "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.

NOTE:

The operating system installation program may offer to reformat the chosen partition. DO NOT format the partition again. The partition has already been formatted and is ready for installing the new operating system.

To install the operating system, insert the operating system installation CD into the optical drive. Restart the computer and follow the installation instructions.

B.2.4 Build-up Recovery Partition

Step 1: Put the recover CD in the optical drive.

Step 2: Start the system.

Step 3: **Boot the system from recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

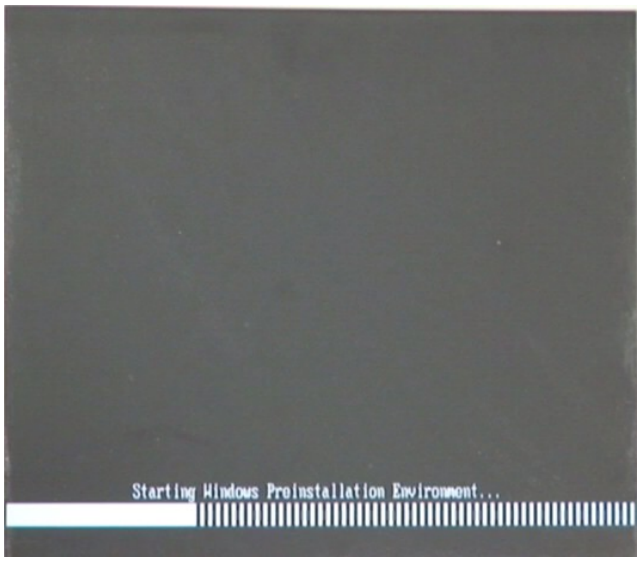


Figure B-6: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press <**2**> then <Enter>.

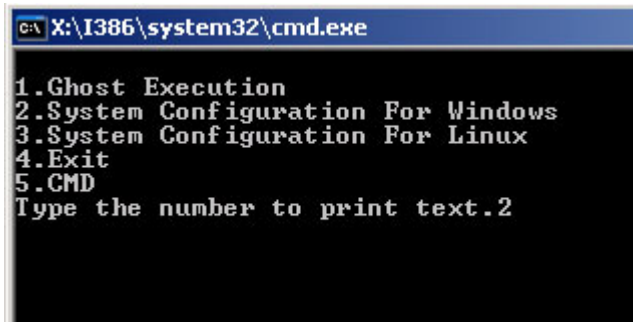


Figure B-7: System Configuration for Windows

Step 5: The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. In this process, the partition which is created for

recovery files in **Section B.2.2** is hidden and the recovery tool is saved in this partition.

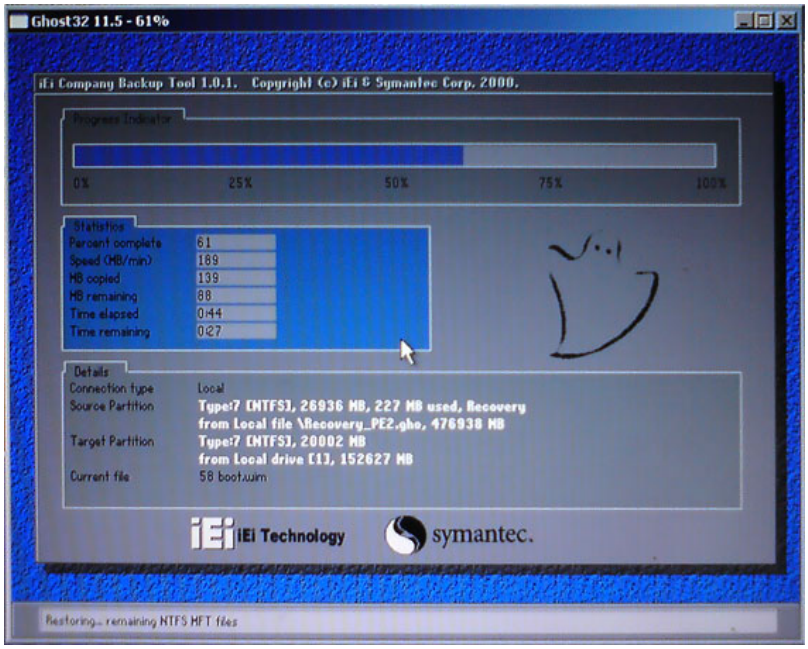


Figure B-8: Build-up Recovery Partition

Step 6: After completing the system configuration, press any key in the following window to reboot the system.

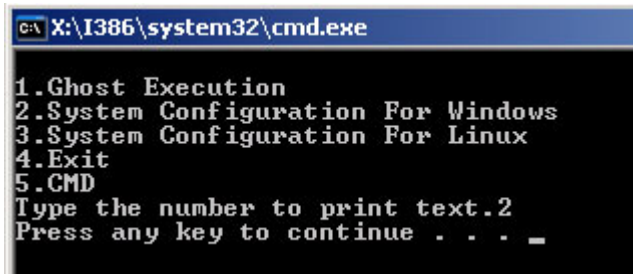


Figure B-9: Press any key to continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image

NOTE:

Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

To create a factory default image, please follow the steps below.

Step 1: Turn on the system. When the following screen displays (**Figure B-10**), press the <**F3**> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.

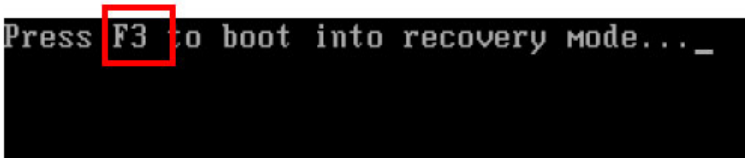


Figure B-10: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <**4**> and press <**Enter**>. (**Figure B-11**)

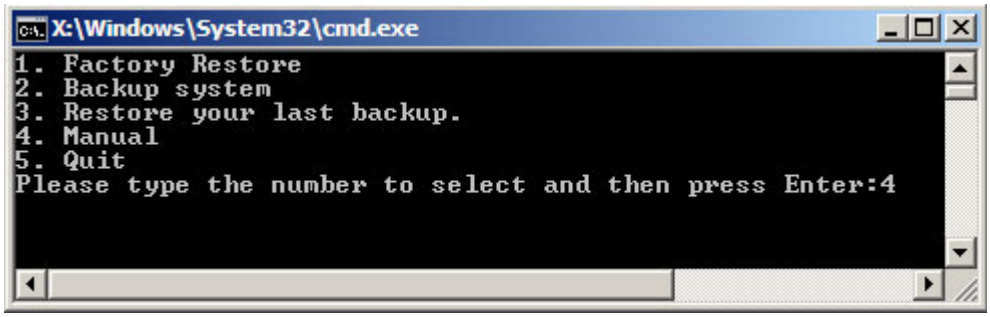


Figure B-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.

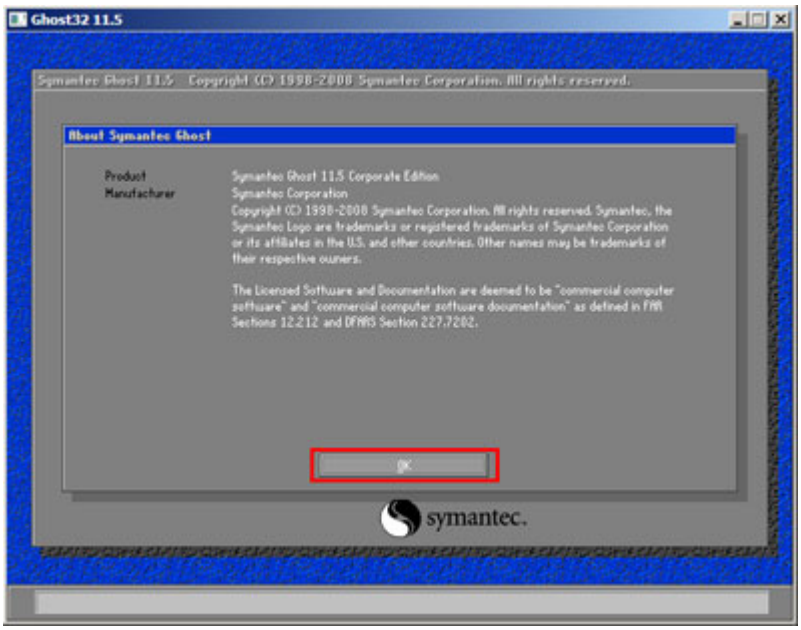


Figure B-12: About Symantec Ghost Window

Step 4: Use mouse to navigate to the option shown below (**Figure B-13**).

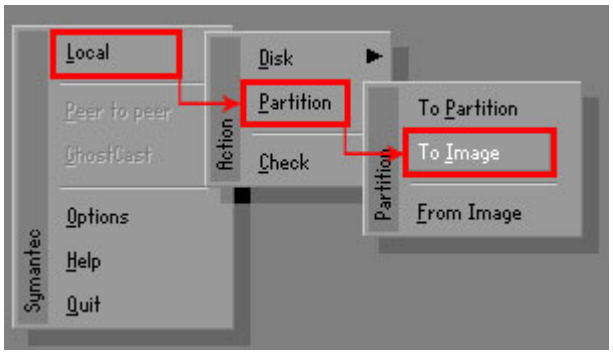


Figure B-13: Symantec Ghost Path

Step 5: Select the local source drive (Drive 1) as shown in **Figure B-14**. Then click OK.

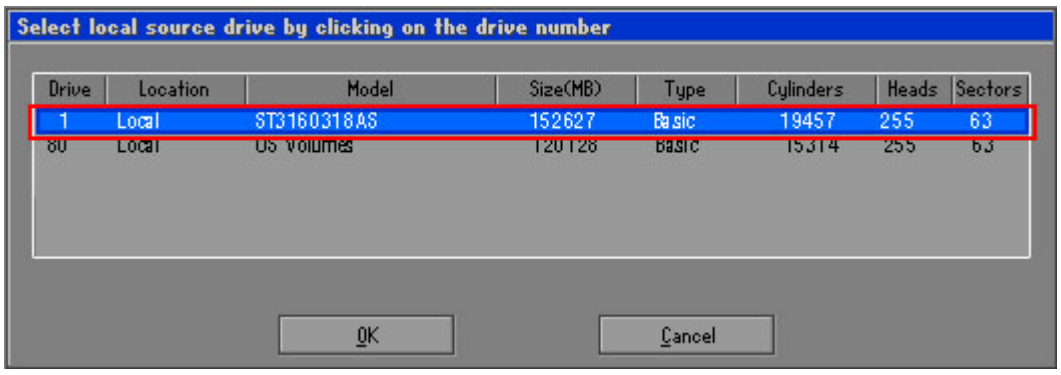


Figure B-14: Select a Local Source Drive

Step 6: Select a source partition (Part 1) from basic drive as shown in **Figure B-15**. Then click OK.

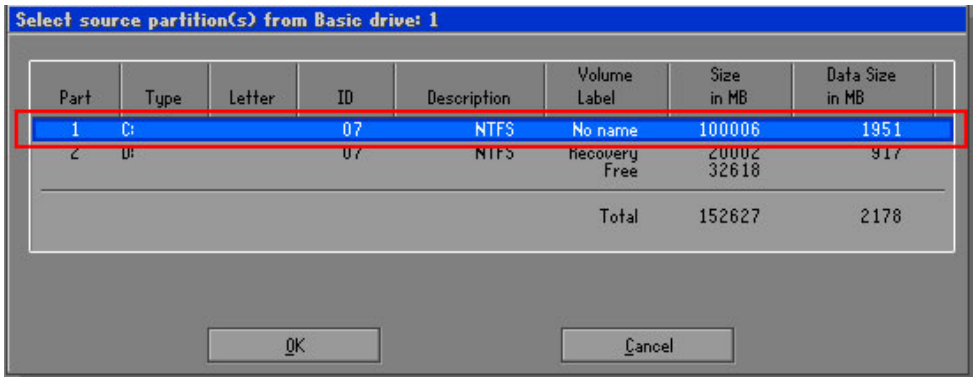


Figure B-15: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (**Figure B-16**). Click **Save**. The factory default image will then be saved in the selected recovery drive and named IEI.GHO.

WARNING:

The file name of the factory default image must be **iei.GHO**.

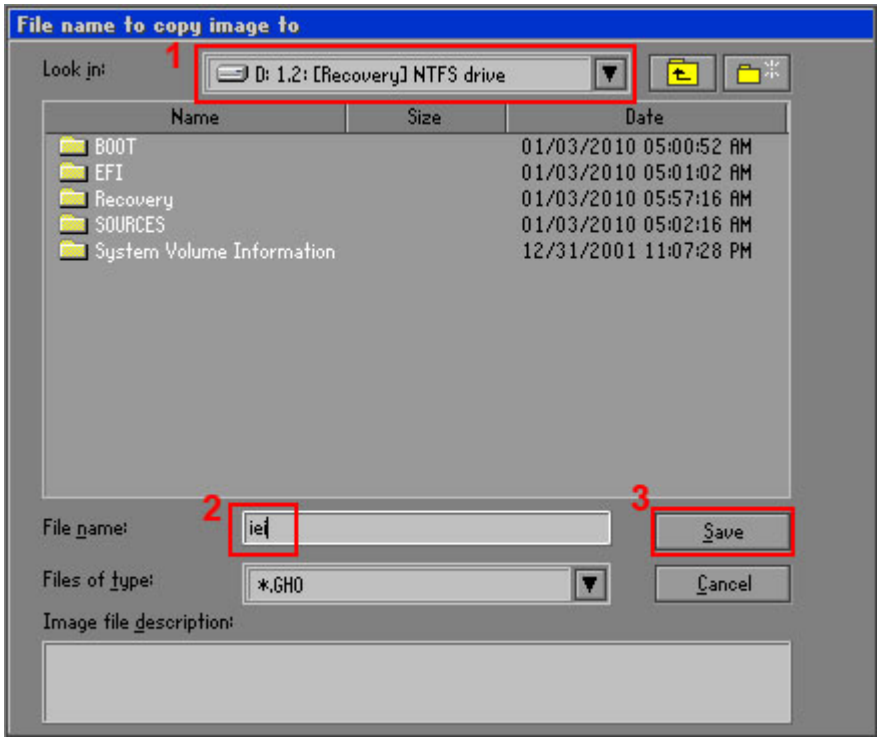


Figure B-16: File Name to Copy Image to

Step 8: When the Compress Image screen in **Figure B-17** prompts, click **High** to make the image file smaller.

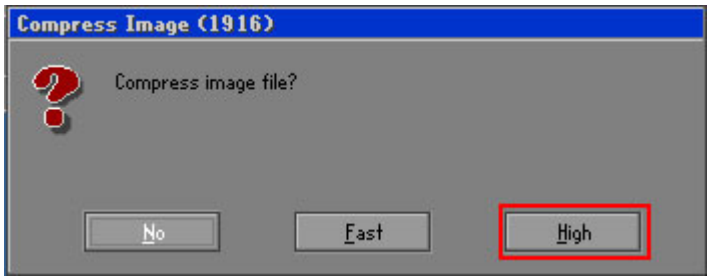


Figure B-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.

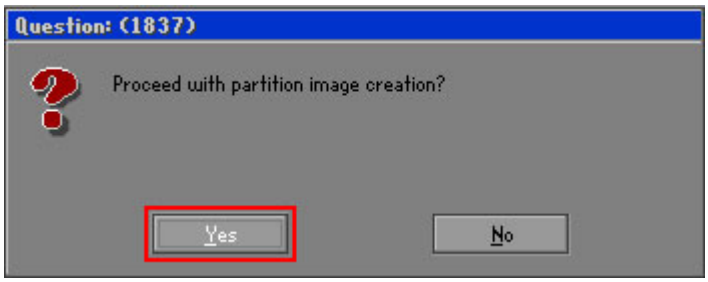


Figure B-18: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure B-19**).

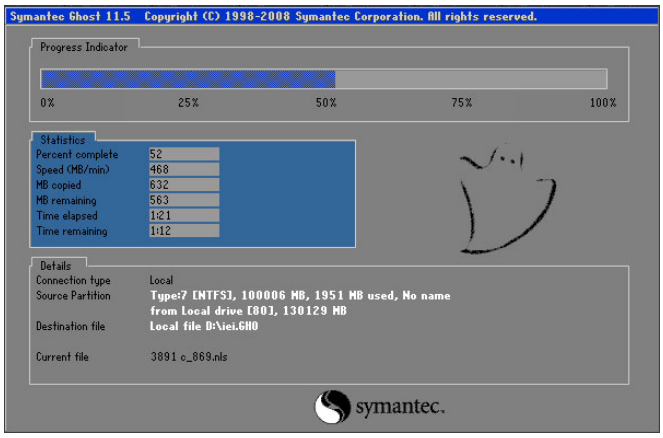


Figure B-19: Image Creation Process

Step 11: When the image creation completes, a screen prompts as shown in **Figure B-20**. Click **Continue** and close the Ghost window to exit the program.

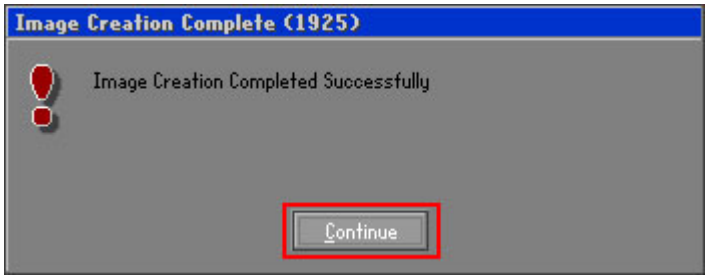


Figure B-20: Image Creation Complete

Step 12: The recovery tool main menu window is shown as below. Press any key to reboot the system.

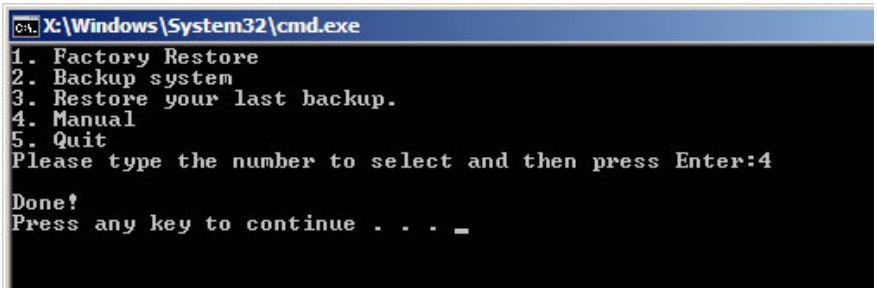


Figure B-21: Press Any Key to Continue

B.3 Setup Procedure for Linux

The initial setup procedures for a Linux system are mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup the recovery tool for Linux OS.

Step 1: **Hardware and BIOS setup**. Refer to **Section B.2.1**.

Step 2: **Install Linux operating system**. Make sure to install GRUB (v0.97 or earlier) MBR type and Ext3 partition type. Leave enough space on the hard drive to create the recover partition later.

NOTE:

If the Linux OS is not installed with GRUB (v0.97 or earlier) and Ext3, the Symantec Ghost may not function properly.

While installing Linux OS, please create two partitions:

- Partition 1: ***/***
- Partition 2: **SWAP**

NOTE:

Please reserve enough space for partition 3 for saving recovery images.

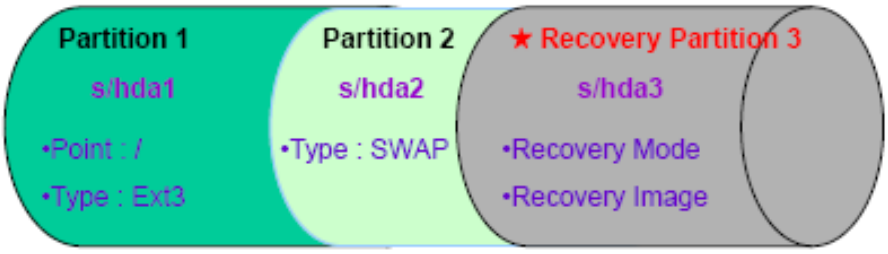


Figure B-22: Partitions for Linux

Step 3: **Create a recovery partition**. Insert the recovery CD into the optical disk drive. Follow **Step 1** ~ **Step 3** described in **Section B.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>exit

system32>format N: /fs:ntfs /q /v:Recovery /y

system32>exit

Step 4: **Build-up recovery partition**. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <**3**> and press <Enter> (**Figure B-23**). The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.

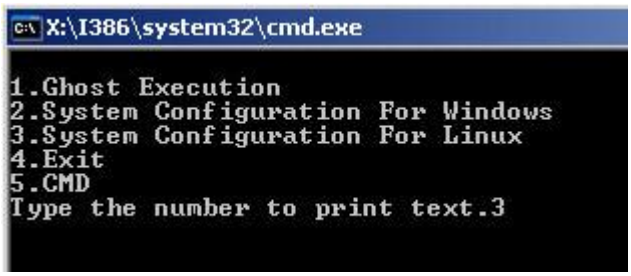


Figure B-23: System Configuration for Linux

Step 5: **Access the recovery tool main menu by modifying the "menu.lst"**. To first access the recovery tool main menu, the menu.lst must be modified. In Linux system, enter Administrator (root). When prompt appears, type:

cd /boot/grub

vi menu.lst

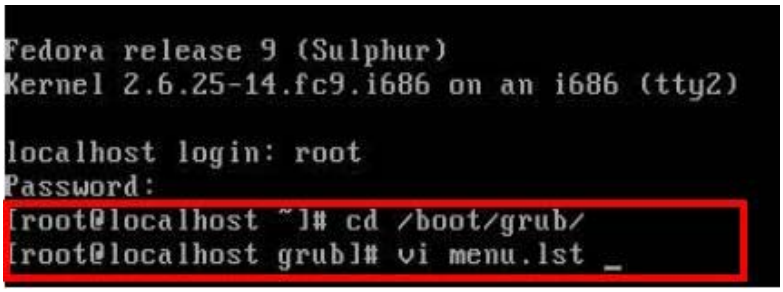
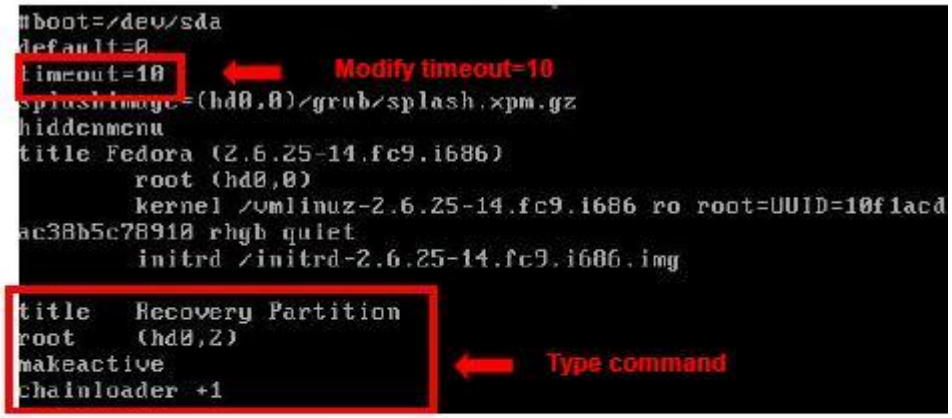


Figure B-24: Access menu.lst in Linux (Text Mode)

Step 6: Modify the menu.lst as shown below.



- Type command:

  title Recovery Partition

  root (hd0,2)

  makeactive

  chainloader +1

Step 7: The recovery tool menu appears. (**Figure B-25**)

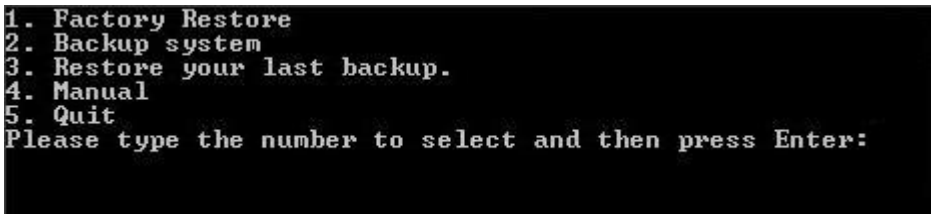

1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:

Figure B-25: Recovery Tool Menu

Step 8: **Create a factory default image**. Follow **Step 2** ~ **Step 12** described in **Section B.2.5** to create a factory default image.

B.4 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The main menu of the recovery tool is shown below.

Figure B-26: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore**: Restore the factory default image (iei.GHO) created in Section B.2.5.
2. **Backup system**: Create a system backup image (iei_user.GHO) which will be saved in the hidden partition.
3. **Restore your last backup**: Restore the last system backup image
4. **Manual**: Enter the Symantec Ghost window to configure manually.
5. **Quit**: Exit the recovery tool and restart the system.

WARNING:

Please do not turn off the system power during the process of system recovery or backup.

WARNING:

All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

B.4.1 Factory Restore

To restore the factory default image, please follow the steps below.

Step 1: Type <**1**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.

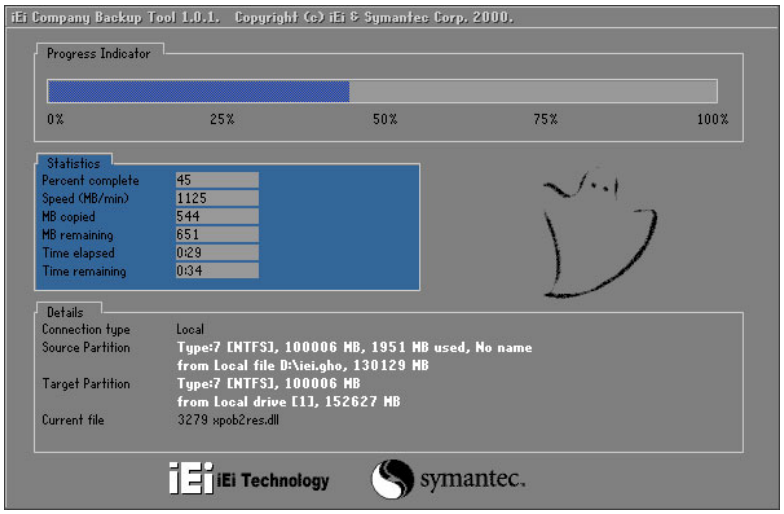


Figure B-27: Restore Factory Default

Step 3: The screen is shown as in **Figure B-28** when completed. Press any key to reboot the system.

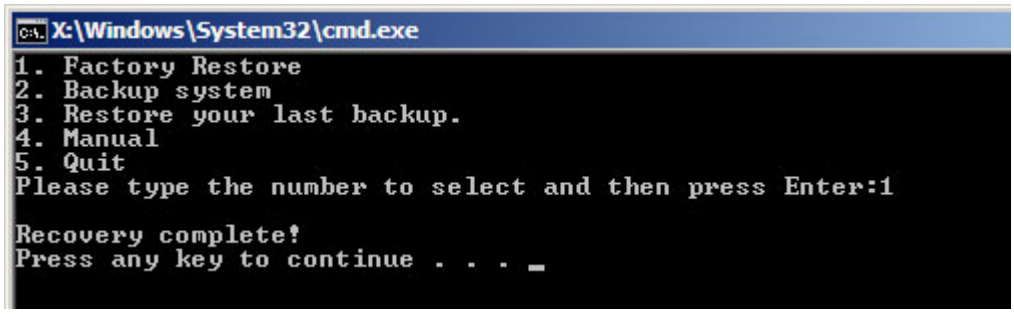

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:1
Recovery complete!
Press any key to continue . . .

Figure B-28: Recovery Complete Window

B.4.2 Backup System

To backup the system, please follow the steps below.

Step 1: Type <**2**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to backup the system. A backup image called **iei_user.GHO** is created in the hidden Recovery partition.

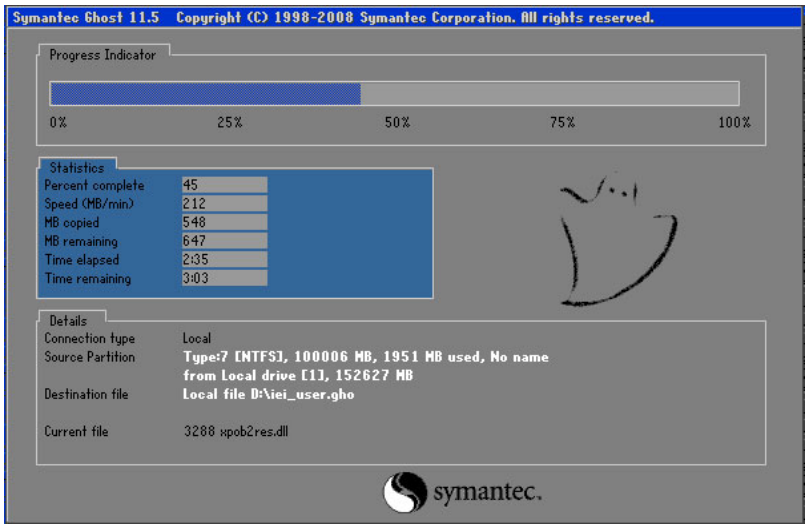


Figure B-29: Backup System

Step 3: The screen is shown as in **Figure B-30** when system backup is completed. Press any key to reboot the system.

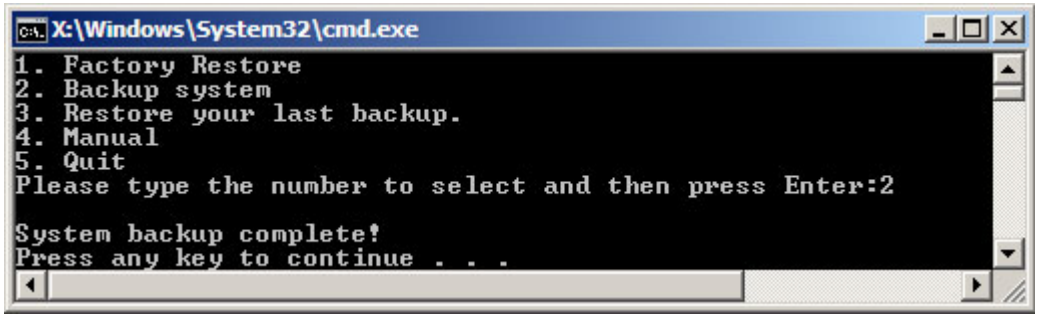

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:2
System backup complete!
Press any key to continue . . .

Figure B-30: System Backup Complete Window

B.4.3 Restore Your Last Backup

To restore the last system backup, please follow the steps below.

Step 1: Type <**3**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).

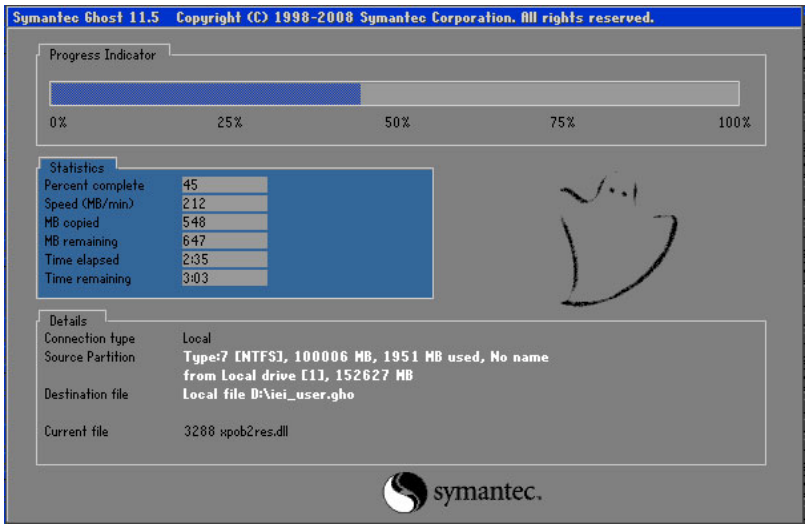


Figure B-31: Restore Backup

Step 3: The screen is shown as in **Figure B-32** when backup recovery is completed. Press any key to reboot the system.

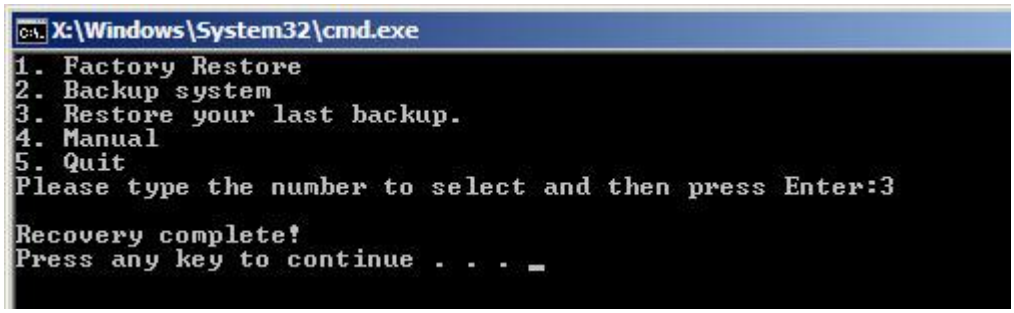

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:3
Recovery complete!
Press any key to continue . . .

Figure B-32: Restore System Backup Complete Window

B.4.4 Manual

To restore the last system backup, please follow the steps below.

Step 1: Type <**4**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

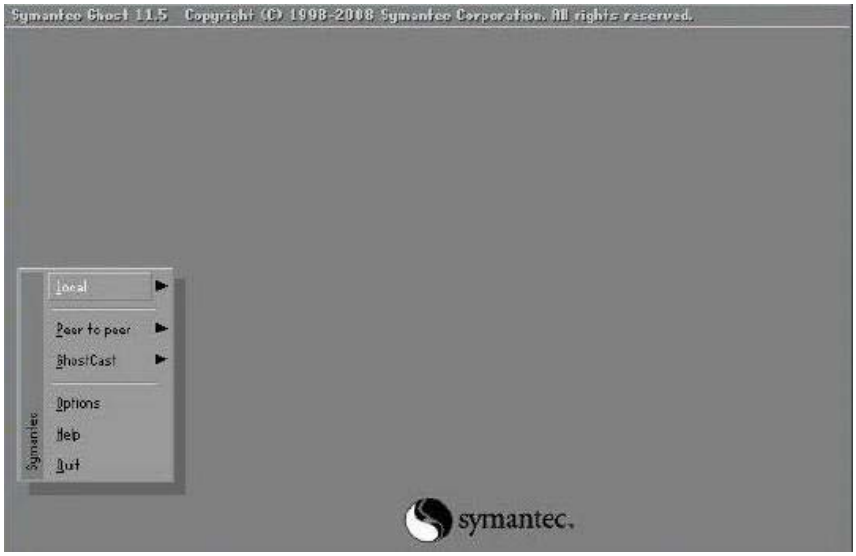


Figure B-33: Symantec Ghost Window

Step 3: When backup or recovery is completed, press any key to reboot the system.

B.5 Other Information

B.5.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

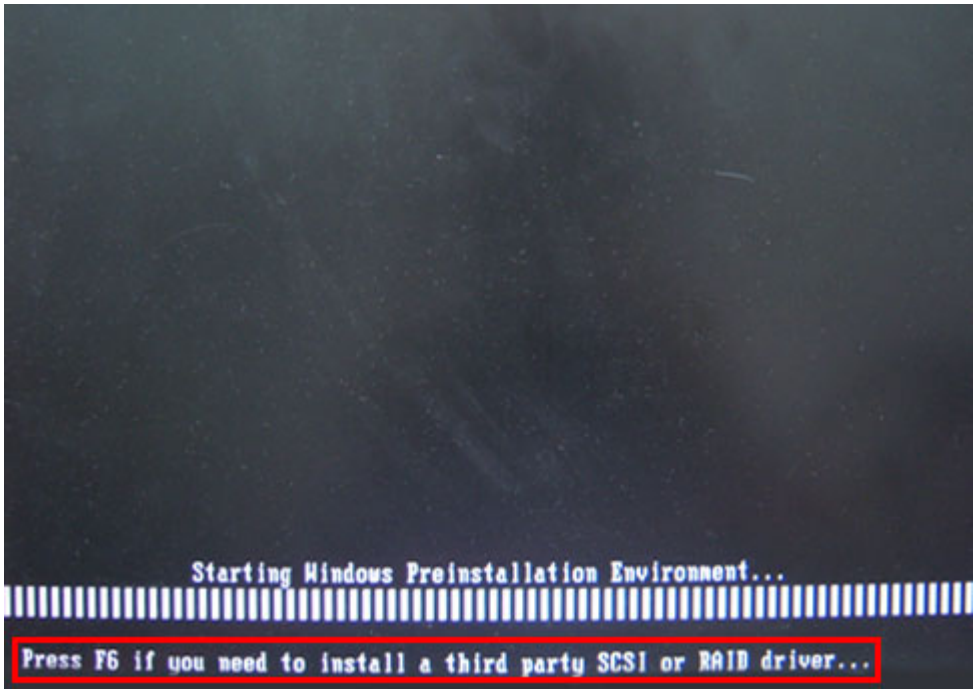
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

Step 1: Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

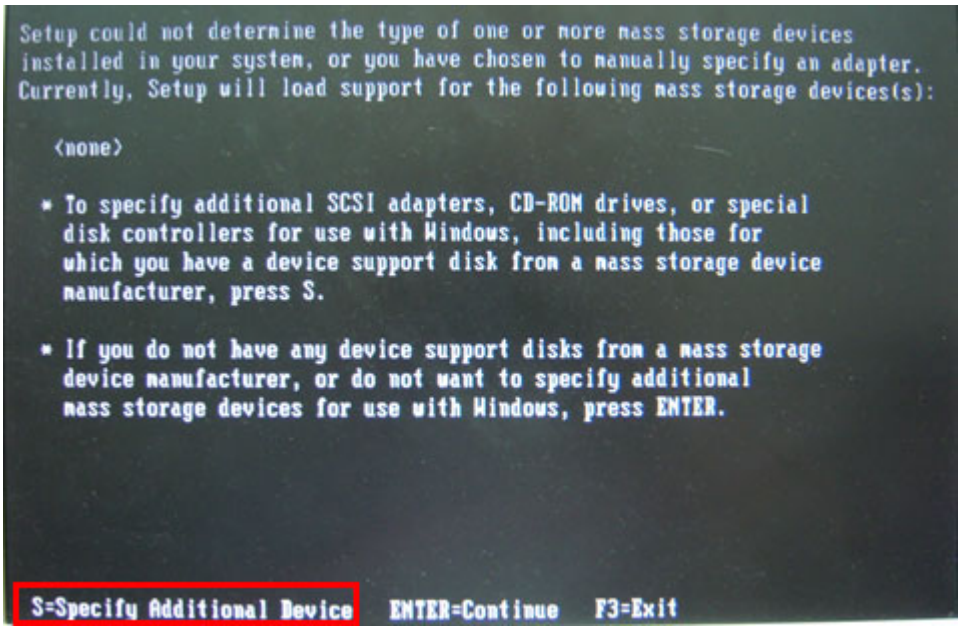
Step 2: Connect the USB floppy disk drive to the system.

Step 3: Insert the One Key Recovery CD into the system and boot the system from the CD.

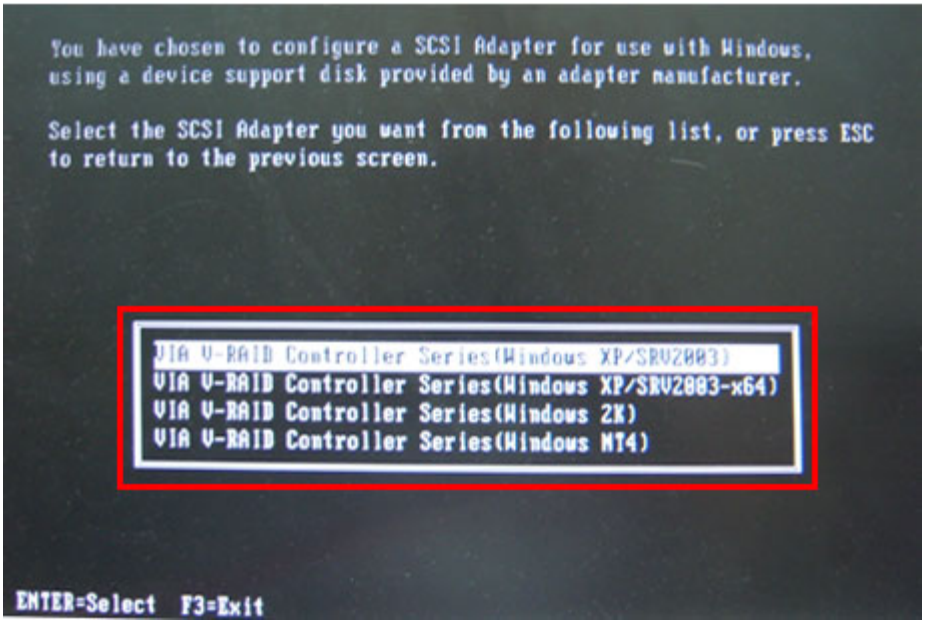
Step 4: When launching the recovery tool, press <**F6**>.



Step 5: When the following window appears, press <**S**> to select “Specify Additional Device”.


Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices(s):
<none>
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Device
ENTER=Continue
F3=Exit

Step 6: In the following window, select a SATA controller mode used in the system. Then press <**Enter**>. The user can now start using the SATA HDD.


You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC to return to the previous screen.
VIA V-RAID Controller Series(Windows XP/SRV2003)
VIA V-RAID Controller Series(Windows XP/SRV2003-x64)
VIA V-RAID Controller Series(Windows 2K)
VIA V-RAID Controller Series(Windows NT4)
ENTER=Select
F3=Exit

Step 7: After pressing <Enter>, the system will get into the recovery tool setup menu. Continue to follow the setup procedure from **Step 4** in **Section B.2.2 Create Partitions** to finish the whole setup process.

B.5.2 System Memory Requirement

To be able to access the recovery tool by pressing <**F3**> while booting up the system, please make sure to have enough system memory. The minimum memory requirement is listed below.

- **Using Award BIOS**: 128 MB system memory
- **Using AMI BIOS**: 512 MB system memory.

Appendix

C

Terminology

AC ’97	Audio Codec 97 (AC’97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
APM	The Advanced Power Management (APM) application program interface (API) enables the inclusion of power management in the BIOS.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is a type of integrated circuit used in chips like static RAM and microprocessors.
COM	COM is used to refer to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal

	computer is usually a male DE-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.

MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.
PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines for full-duplex (two-way) serial (point-to-point) communications between the SBC components and/or expansion cards and the SBC chipsets. Each line has a 2.5 Gbps data transmission rate and a 250 MBps sustained data transfer rate.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
QVGA	Quarter Video Graphics Array (QVGA) refers to a display with a resolution of 320 x 240 pixels.
RAM	Random Access Memory (RAM) is a form of storage used in computer. RAM is volatile memory, so it loses its data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA Revision 1.x bus has transfer speeds up to 1.5 Gbps and the SATA Revision 2.x bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.

USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12 Mbps data transfer rates, while USB 2.0 supports 480 Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30                  ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1             ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

Appendix

E

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the NANO-GM45A2.

E.1 Compatible Operating Systems

The following operating systems have been successfully run on the NANO-GM45A2.

- Microsoft Windows 7 (Beta)
- Microsoft Windows Vista Ultimate (32-bit)
- Microsoft Windows Vista Ultimate (64-bit)
- Microsoft Windows XP with SP2 (32-bit)
- Microsoft Windows XP with SP2 (64-bit)
- Microsoft Server 2008 (32-bit)
- Microsoft Server 2008 (64-bit) (Chinese version)
- Microsoft Server 2003 (32-bit)
- Microsoft Server 2003 (64-bit) (Chinese version)
- Microsoft Windows 2000 with SP4
- Microsoft XPE-POS (32-bit)
- Microsoft DOS 6.22
- Linux (Mandriva 2009)
- Linux (ubuntu 8.1.0)
- Linux (openSuSE 11.0)
- Linux (Fedora 9)

E.2 Compatible Processors

The following Socket P processors have been successfully tested on the NANO-GM45A2.

CPU	Model Number	Clock Speed	FSB	Architecture
Intel® Core™2 Duo	P7350	2.00 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	P8700	2.53 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	T7500	2.20 GHz	800 MHz	65 nm
Intel® Core™2 Duo	T7700	2.40 GHz	800 MHz	65 nm
Intel® Core™2 Duo	T7800	2.60 GHz	800 MHz	45 nm
Intel® Core™2 Duo	T8300	2.40 GHz	800 MHz	45 nm
Intel® Core™2 Duo	T9400	2.53 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	T9500	2.60 GHz	800 MHz	45 nm
Intel® Core™2 Duo	T9550	2.66 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	T9600	2.80 GHz	1066 MHz	45 nm

E.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the NANO-GM45A2 other memory modules that comply with the specifications may also work on the NANO-GM45A2 but have not been tested.

The following DDR3 memory modules have been successfully tested on the NANO-GM45A2.

Manufacturer	Capacity	Speed
InnoDisk	1.0 GB	1066 MHz
InnoDisk	2.0 GB	1066 MHz
InnoDisk	1.0 GB	1333 MHz

Kingston	1.0 GB	1066 MHz
Samsung	1.0 GB	1066 MHz
Transcend	1.0 GB	1066 MHz
Transcend	2.0 GB	1066 MHz
Transcend	2.0 GB	1333 MHz

Appendix

F

Hazardous Materials Disclosure

F.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。